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## **Digitisation Notes:**

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**Environmental Change in the west-central  
Mexican highlands over the last 1,000 years:  
evidence from lake sediments.**

**Sarah Jane Davies, B. A. (hons), MRes.**

**Volume II: Figures, Tables, Plates & Appendices**

**Thesis submitted for the degree of Doctor of Philosophy**

**May 2000**

**Department of Geography, University of Edinburgh**



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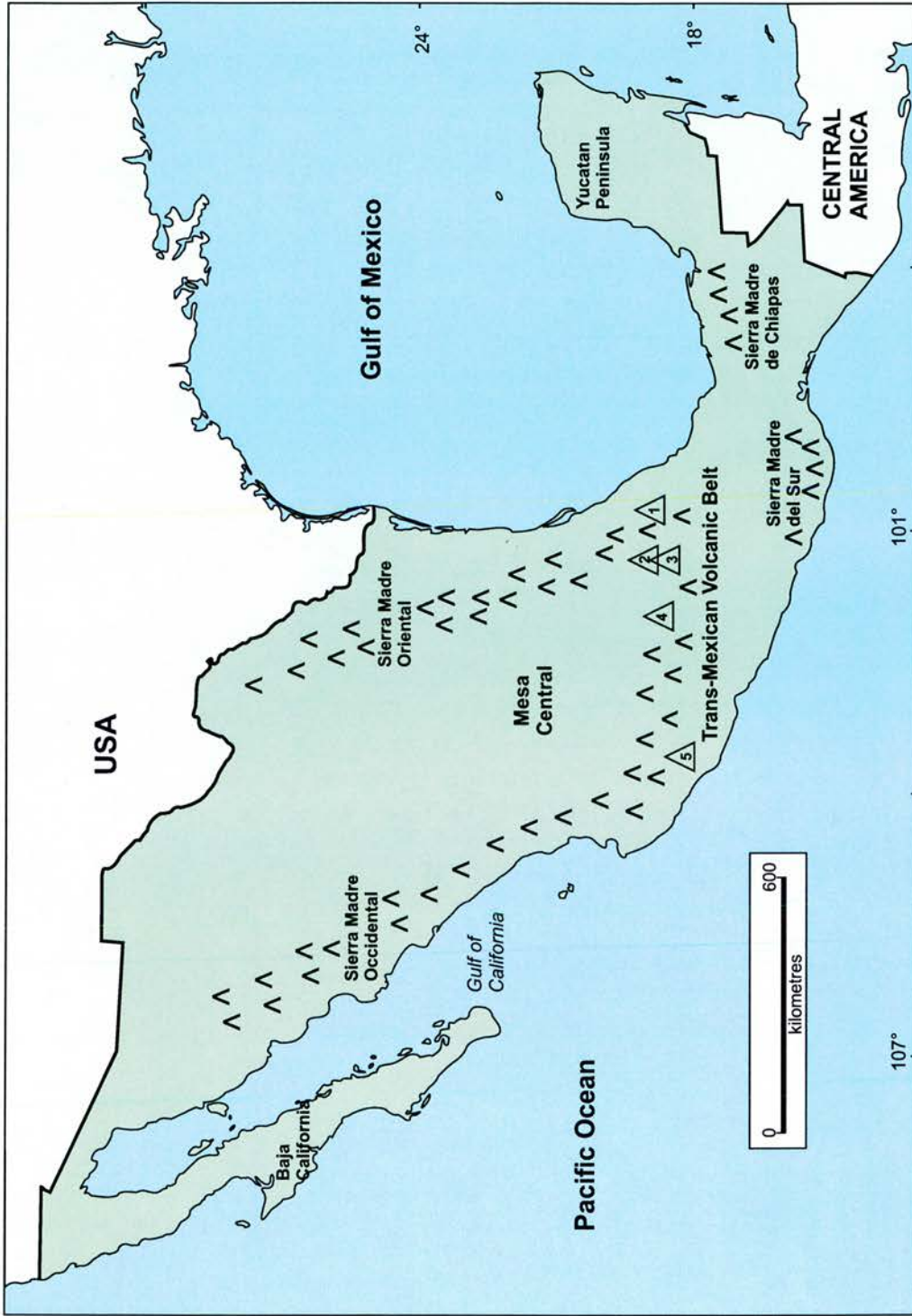
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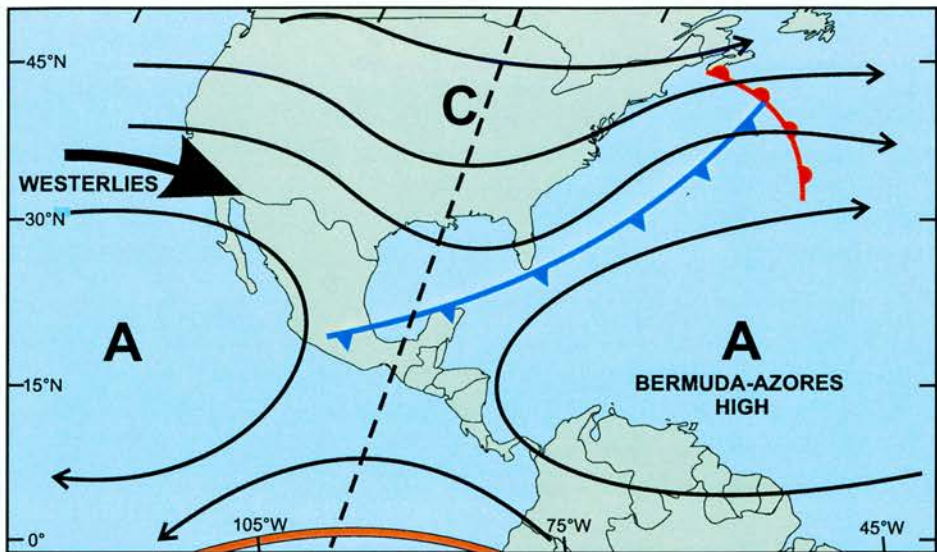
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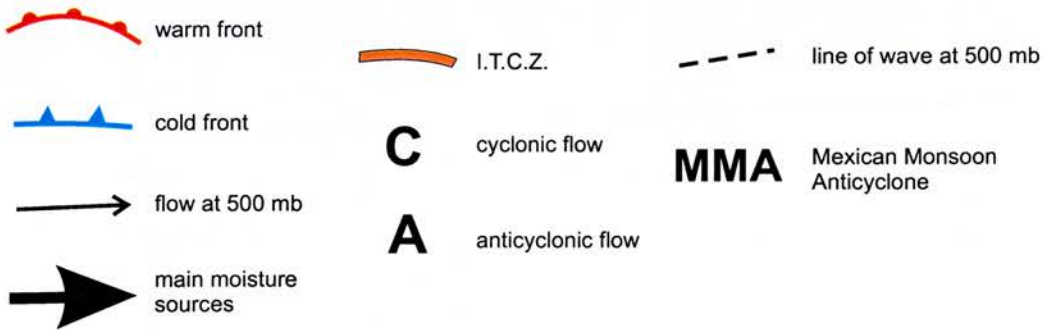
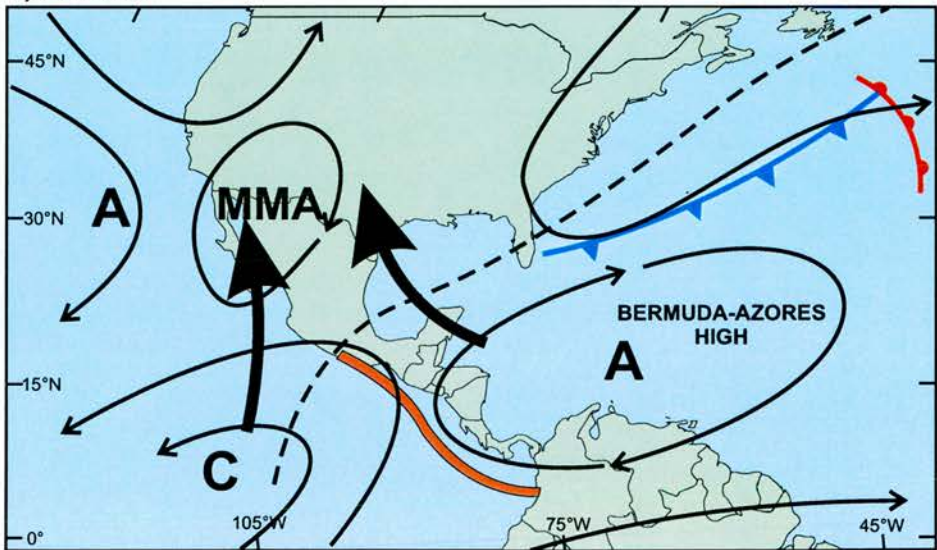


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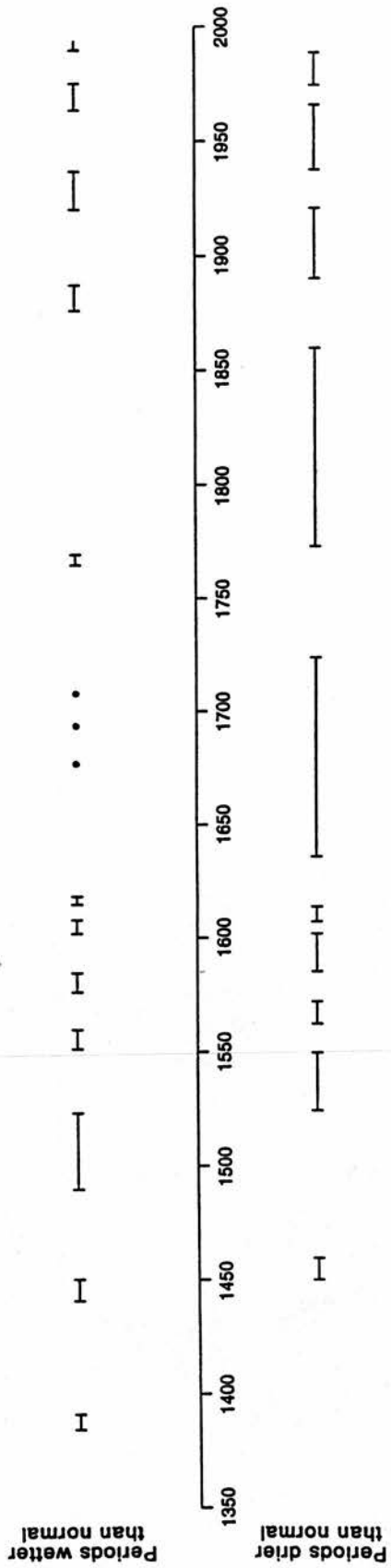


a) winter

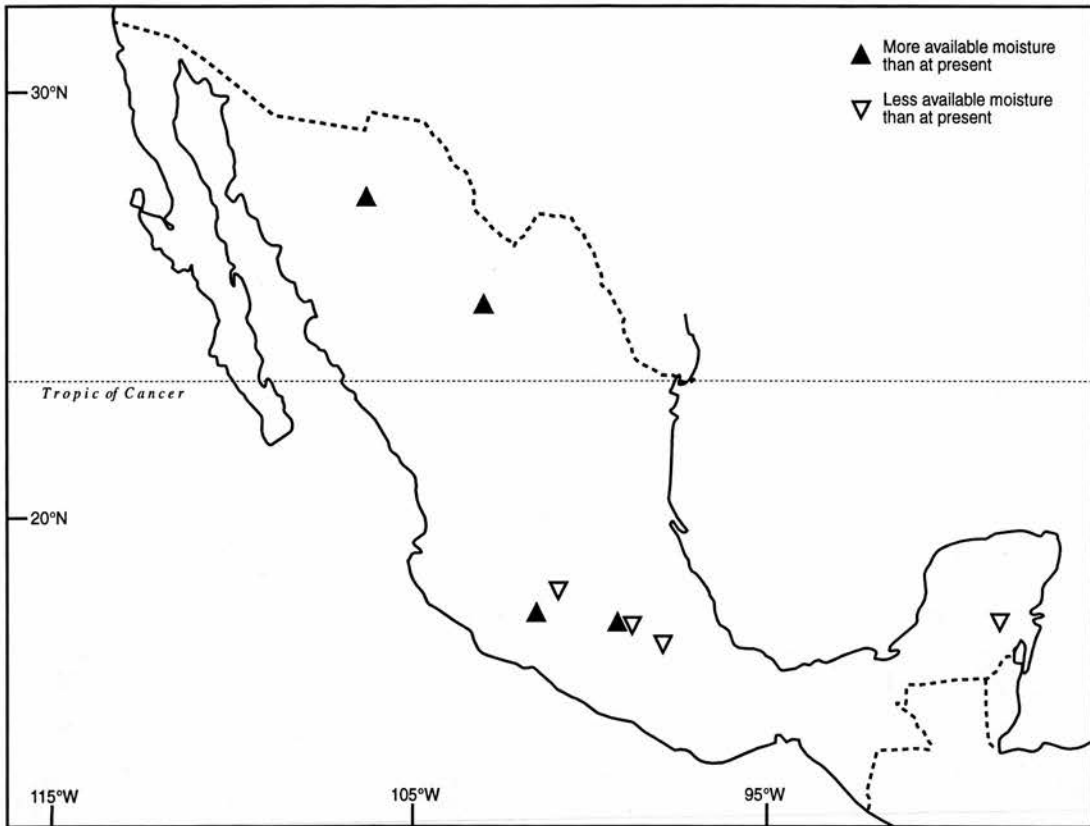
b) summer



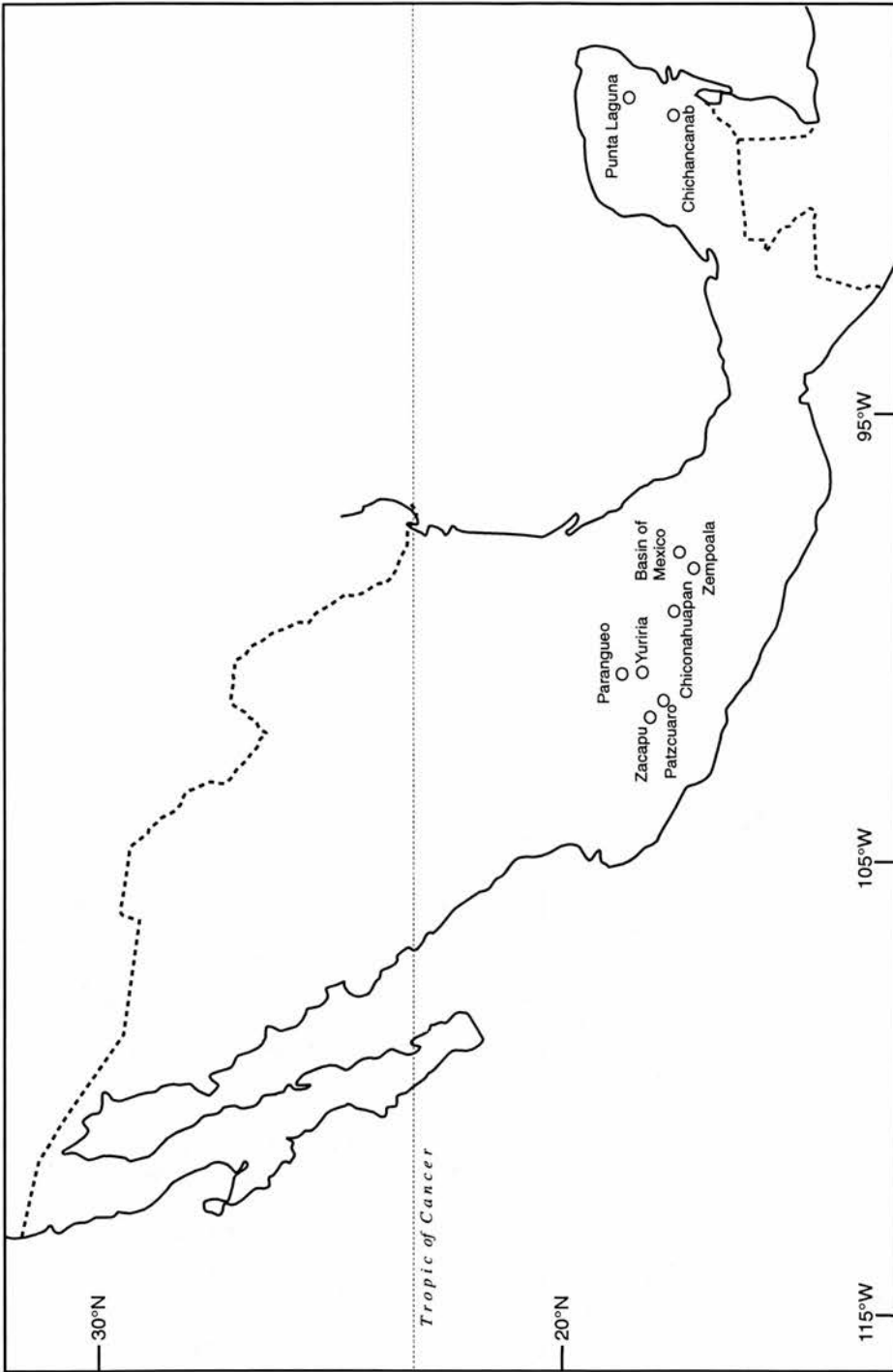
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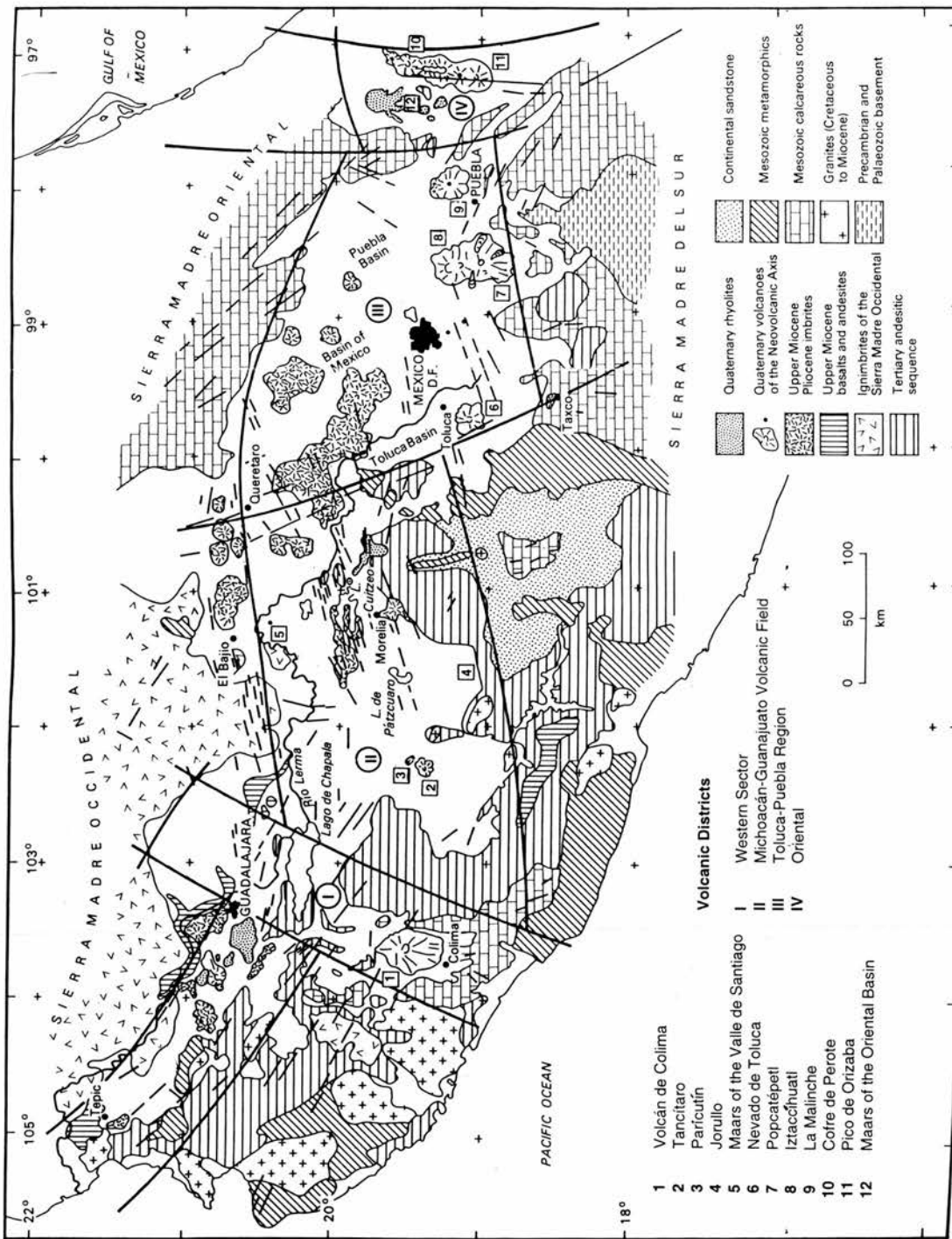
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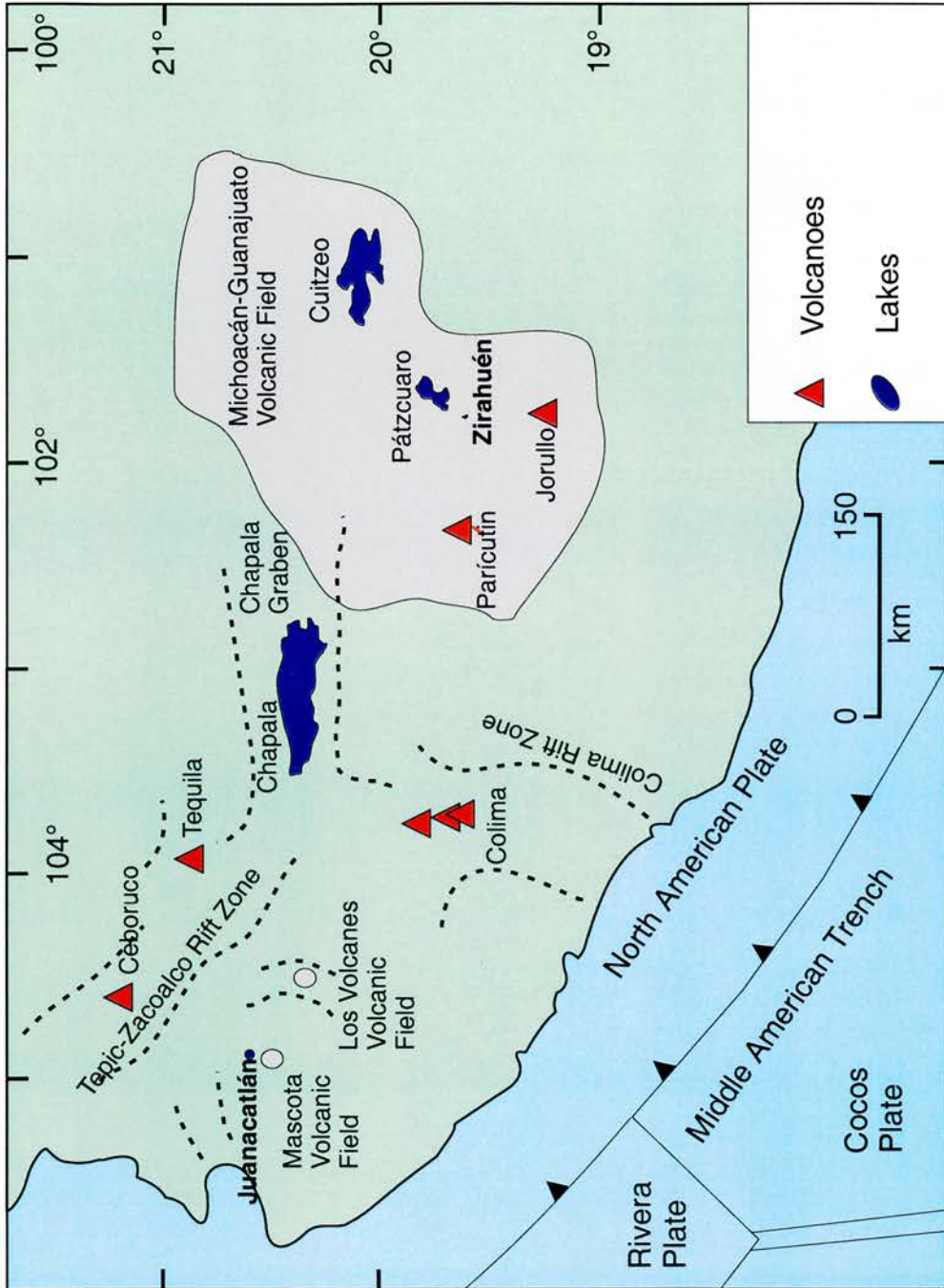
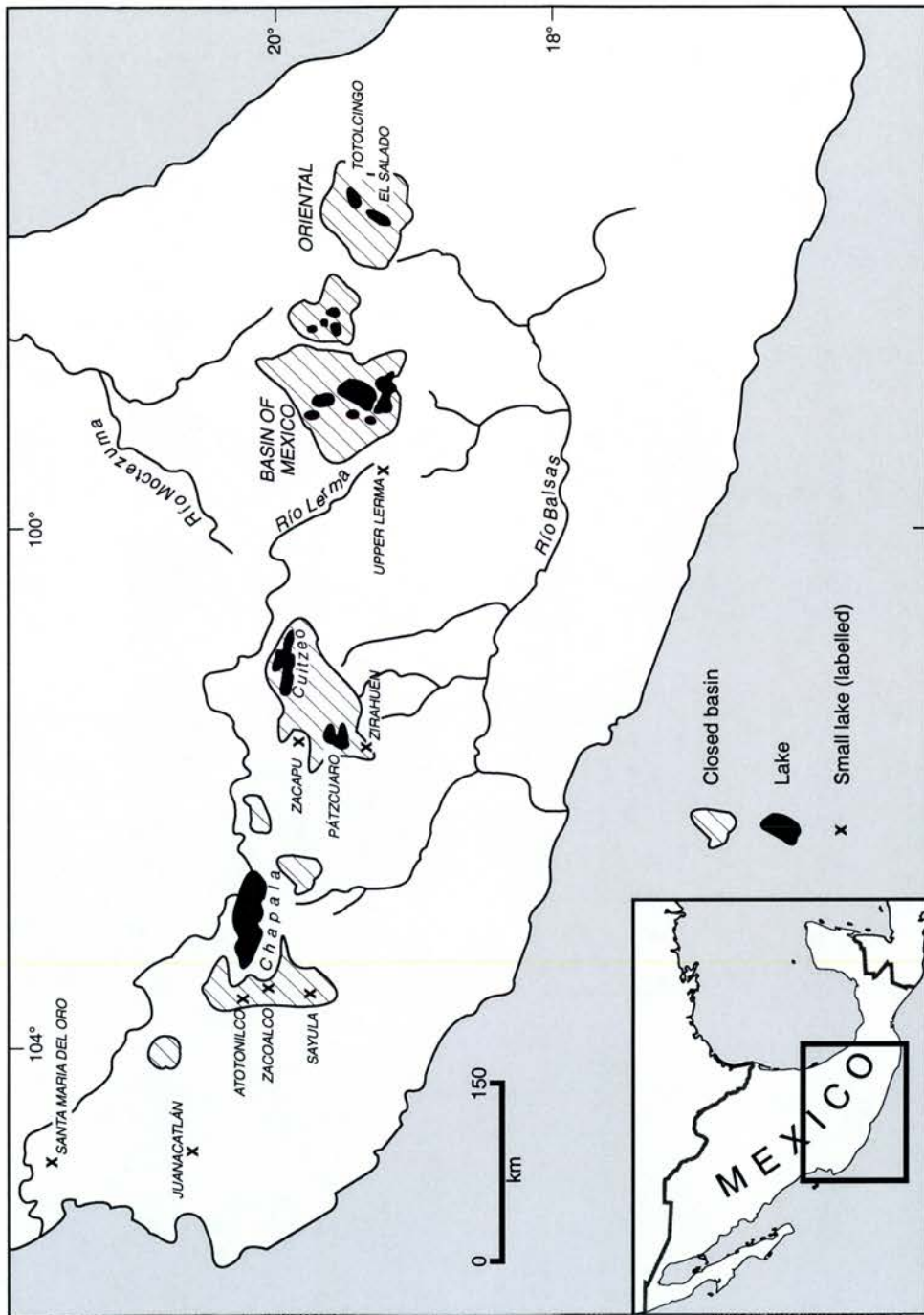


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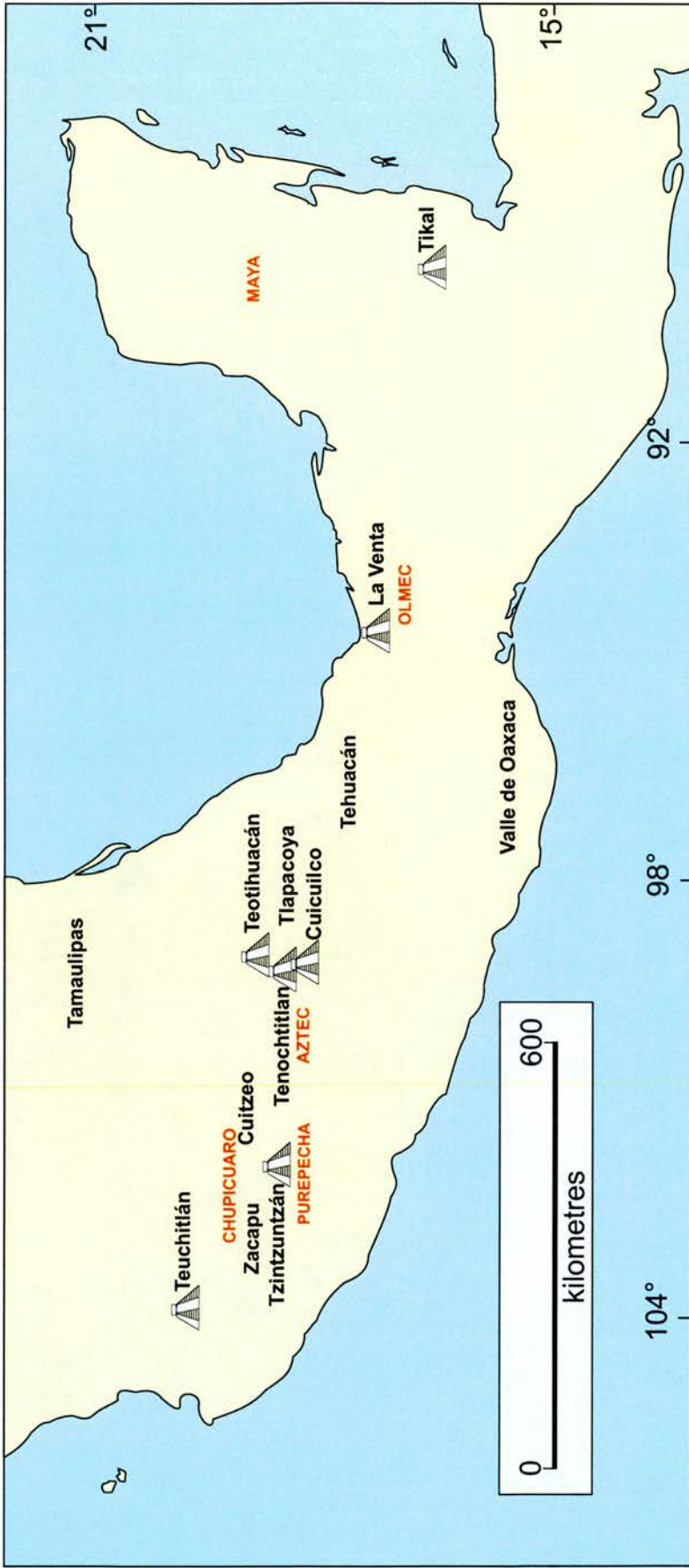
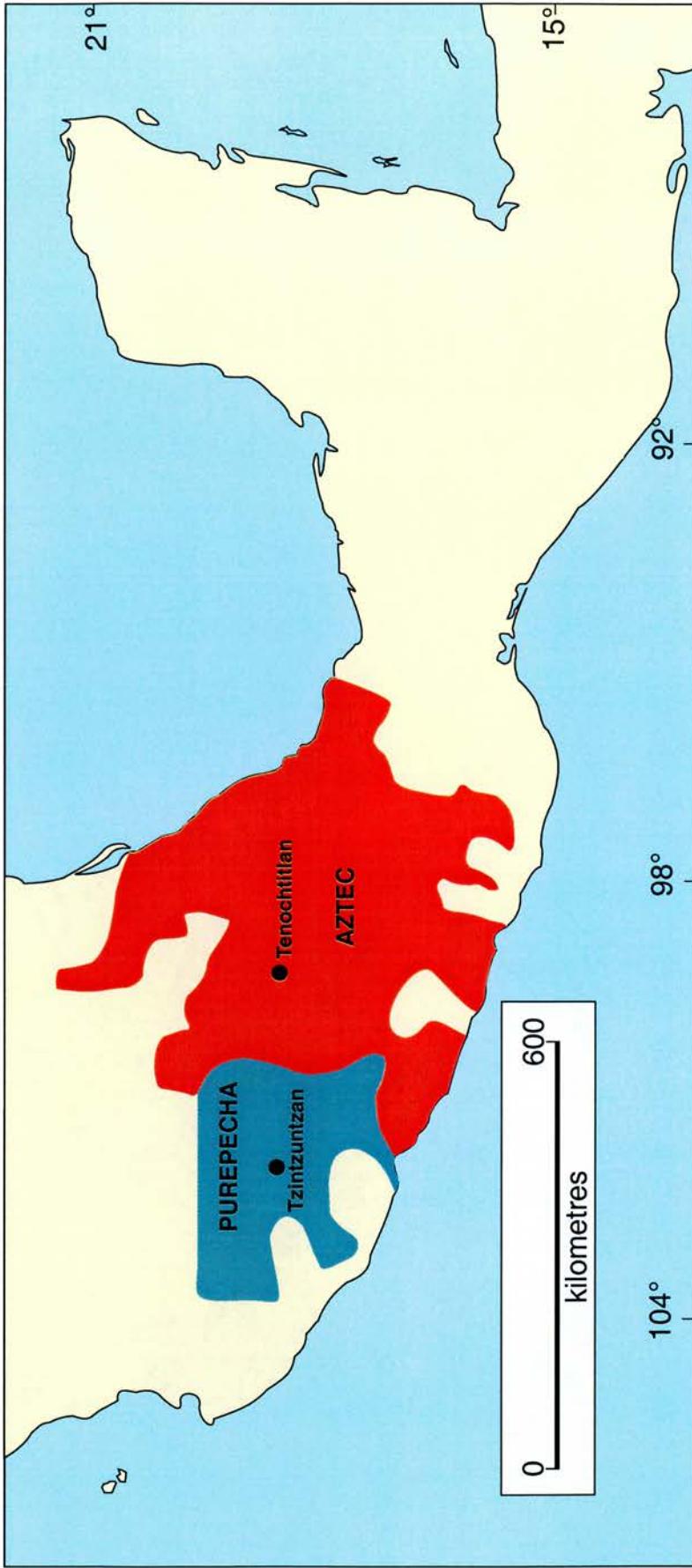
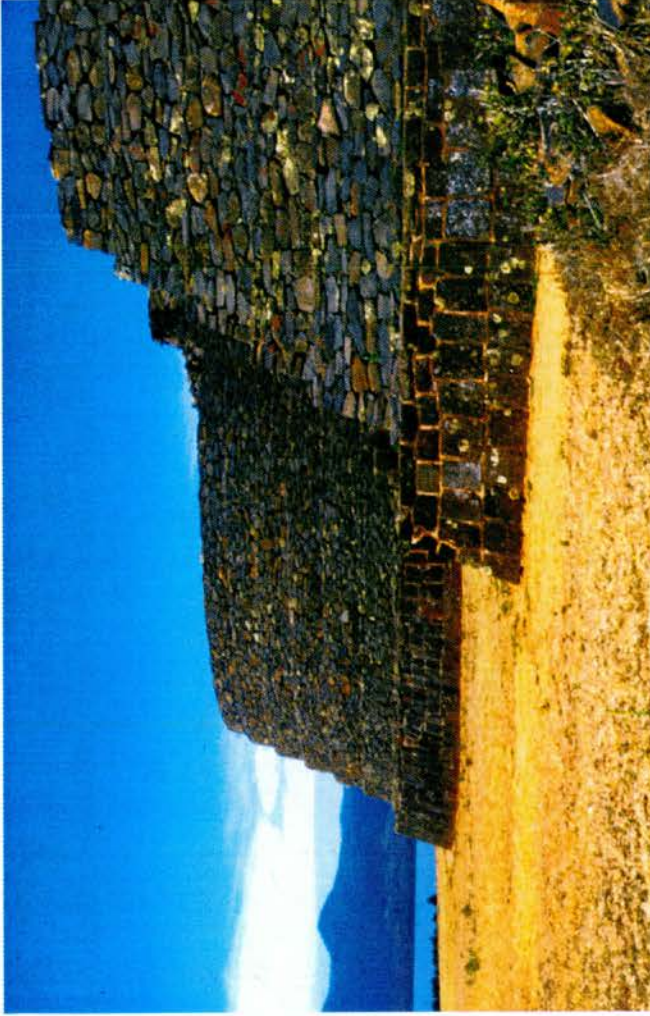


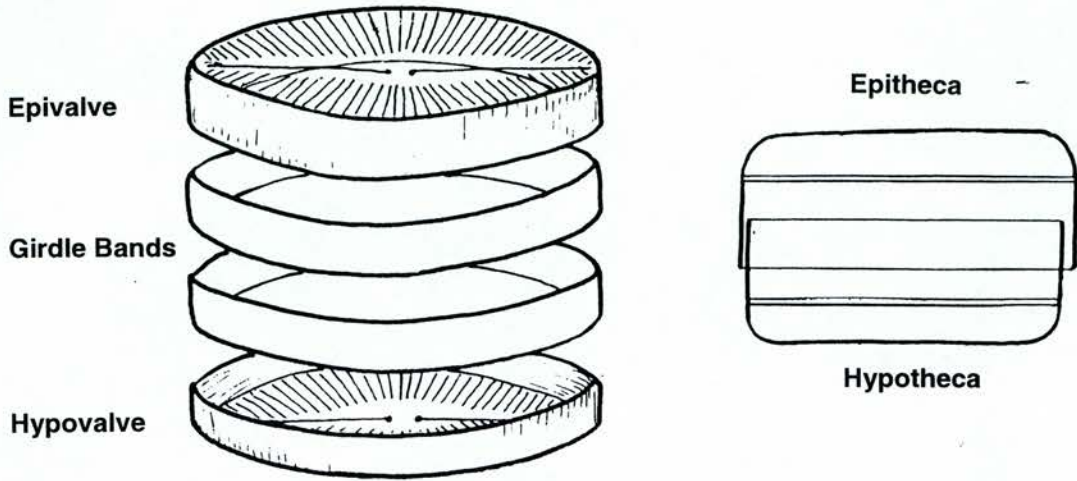
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**Figure 3.6:** The ceremonial *yacatas* at Tzintzuntzan, capital of the Post-Classic Purepecha Empire (Photograph: A. J. Newton).



**The Diatom Frustule**



**Centric**



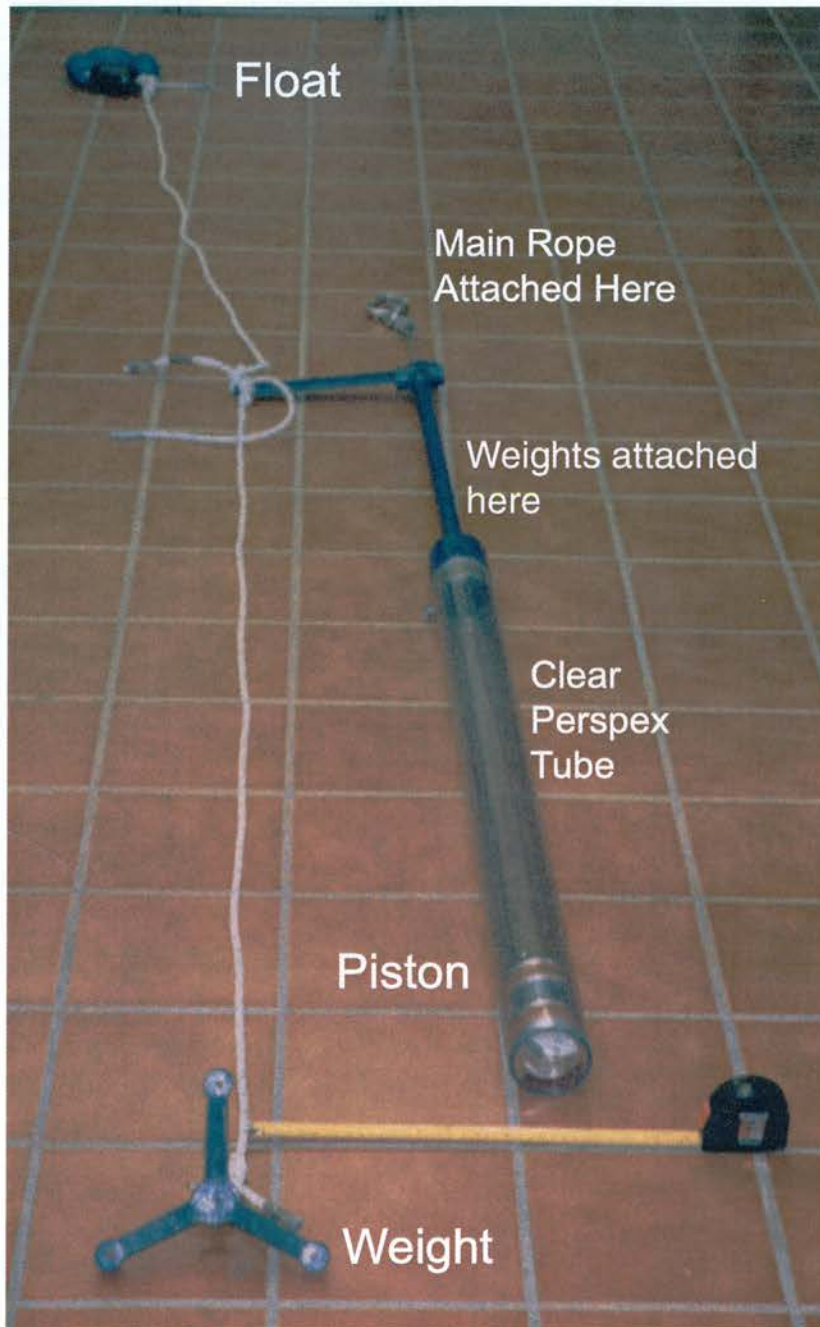
**Araphid Pennate**



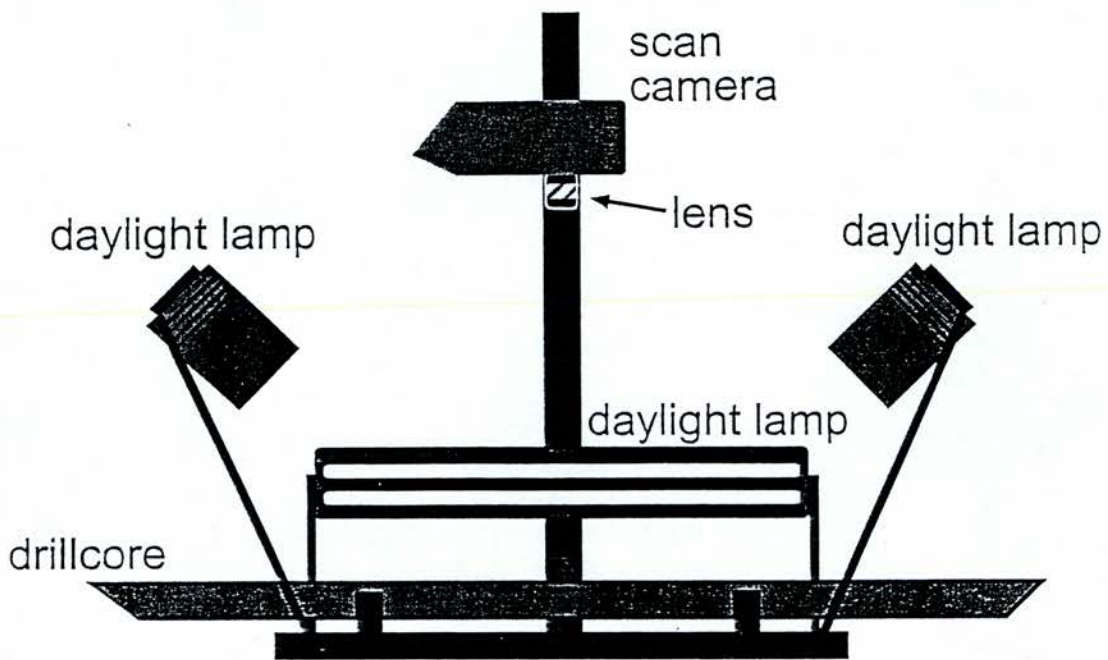
**Raphid Pennate**

**Valve Morphology**

**Figure 4.1:** The structure and morphology of the diatom frustule (Modified from Barber and Haworth, 1981).



**Figure 4.2:** The micro-Kullenberg corer (Photograph: A. Newton).



**Figure 4.3:** The camera system used to obtain images of sediment cores for Digital Sediment Colour Analysis (after Schaaf and Thurow, 1997).

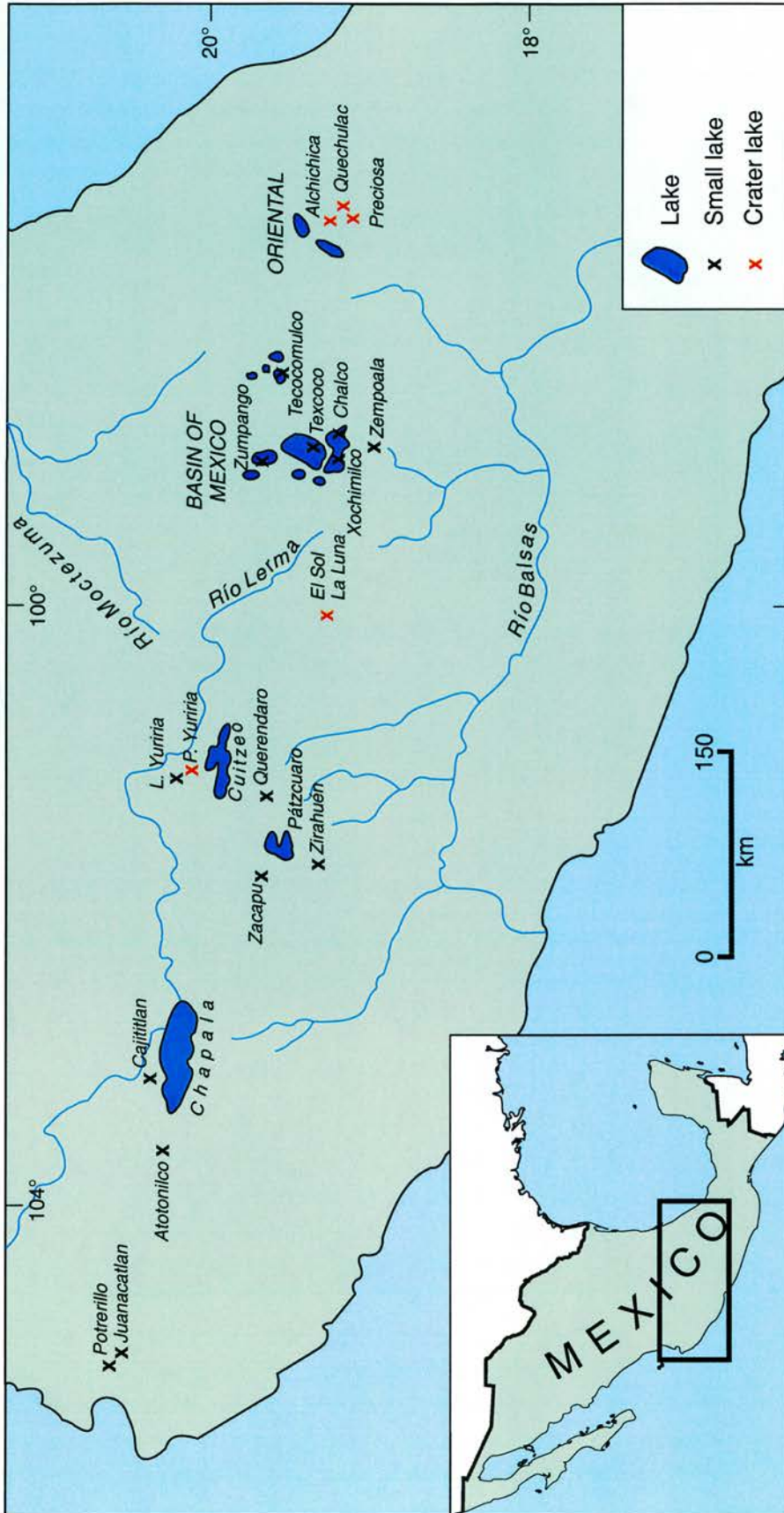


Figure 5.1: Location of modern diatom sampling sites mentioned in the text.

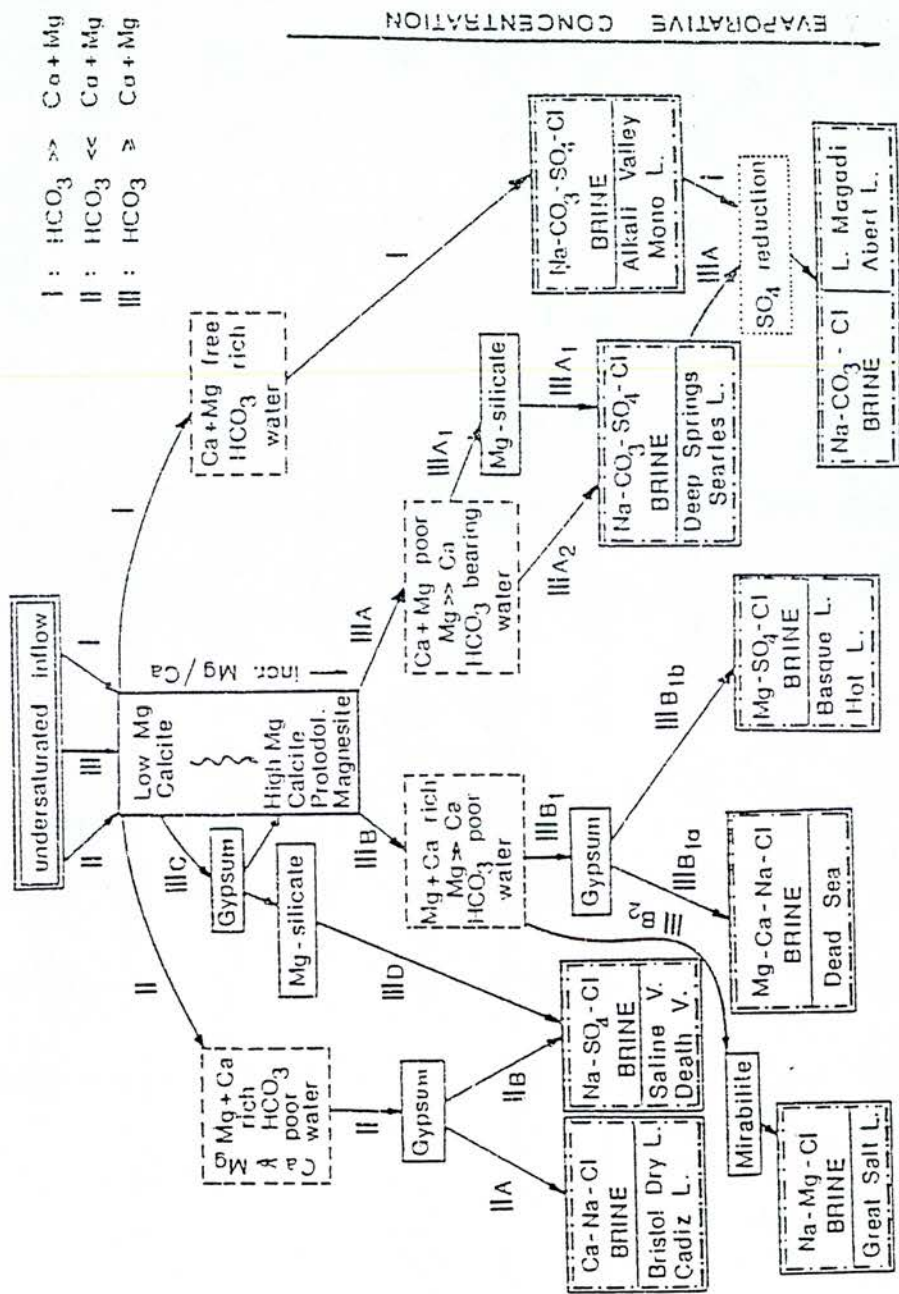
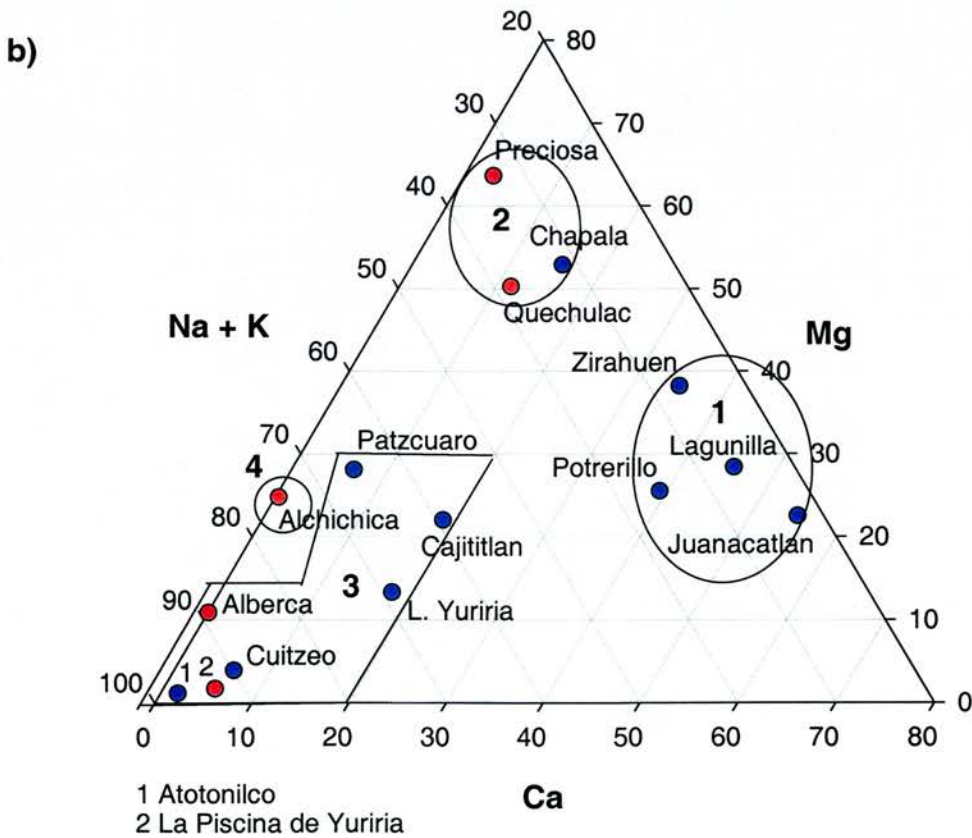
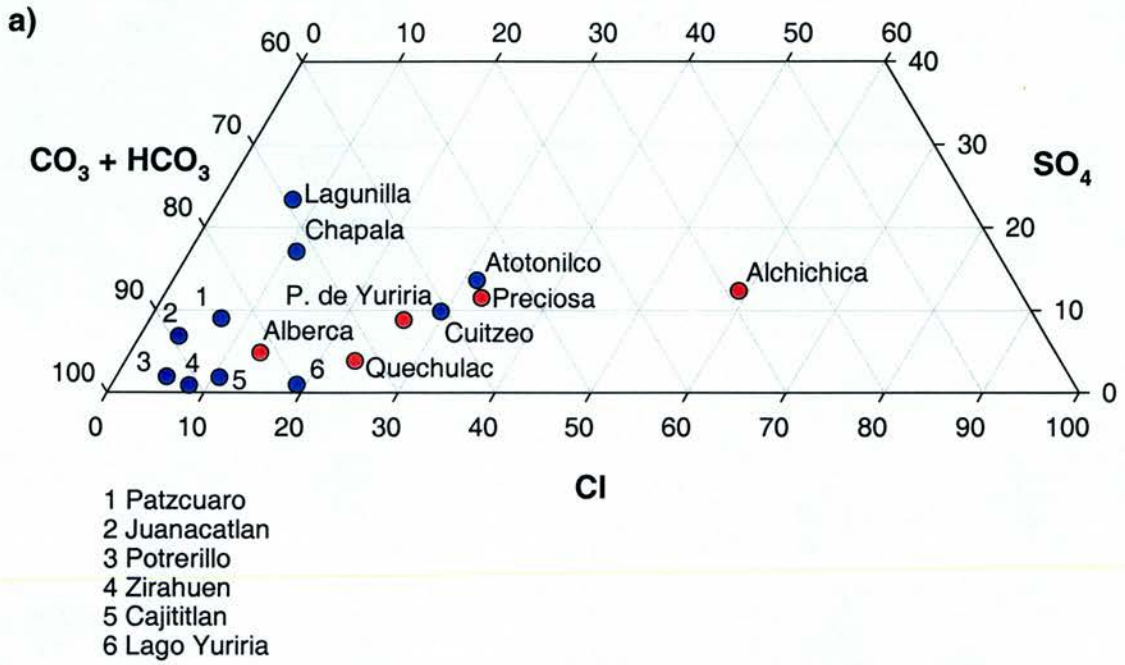


Figure 5.2: Pathways of brine evolution through evaporative concentration (from Eugster and Hardie, 1978).



**Figure 5.3:** Major anion (a) and cation (b) composition of lakes sampled. Crater lakes are labelled in red. Chemical groupings are shown in Figure 5.3b.

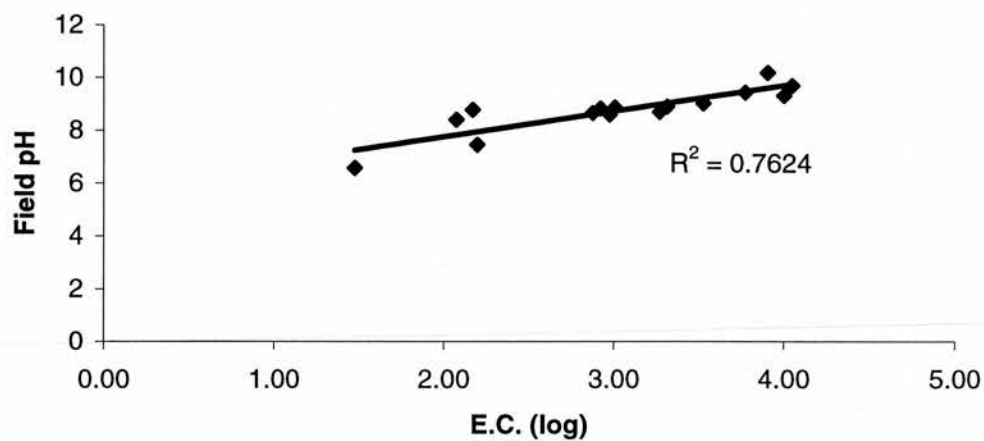


**Figure 5.4a:** Laguna Alchichica showing calcite reef deposits at the edge of the lake.



**Figure 5.4b:** Laguna Preciosa in April 1997 during a "whiting" event.

a) E.C. v. Field pH



b) E.C. v. Alkalinity

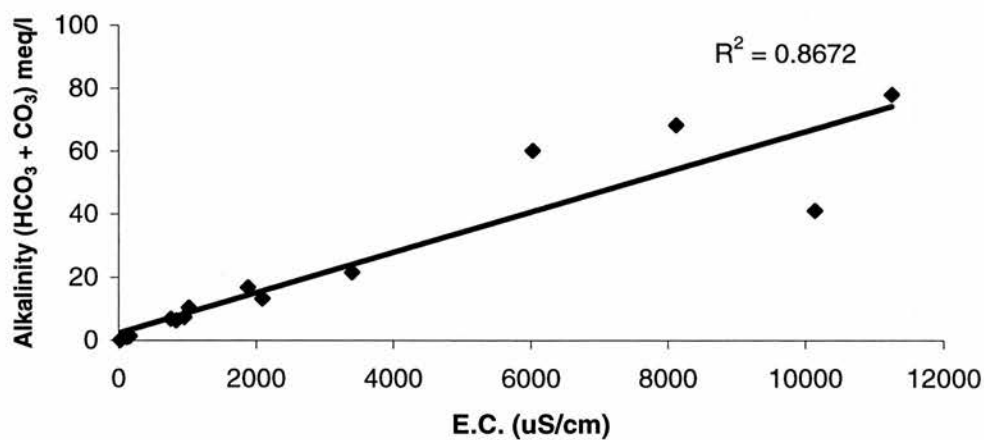
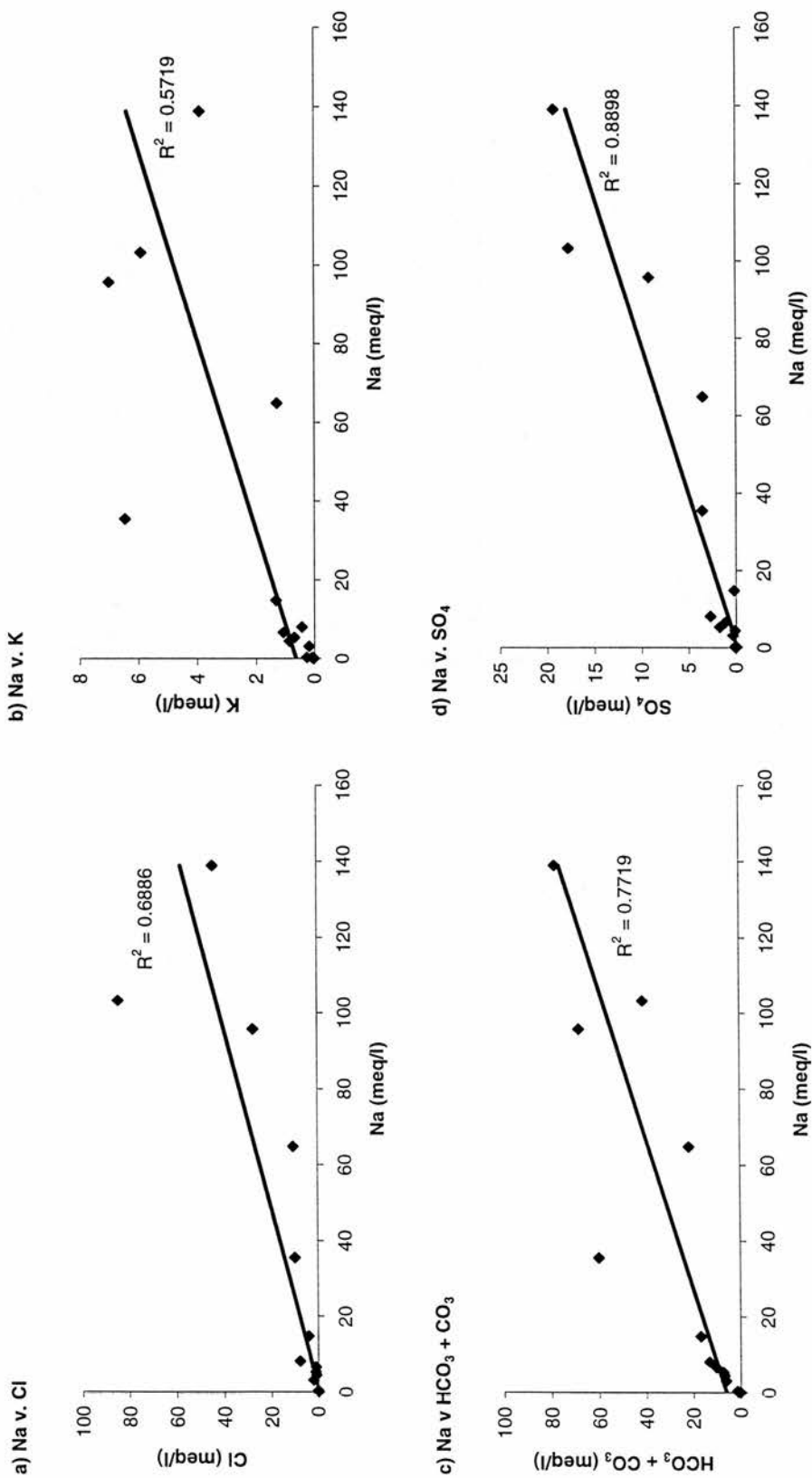
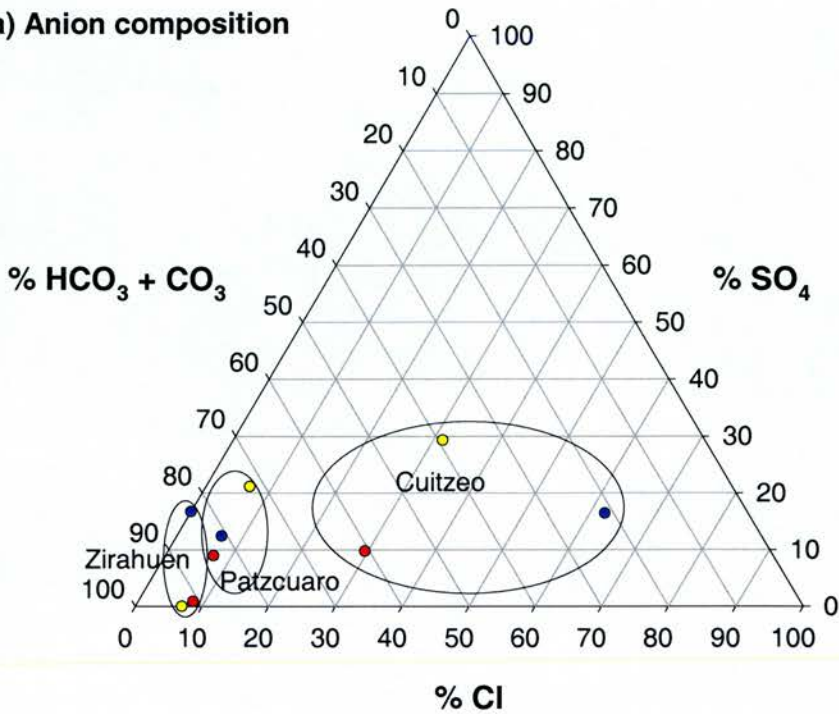


Figure 5.5: The relationship between E.C. and (a) field pH and (b) alkalinity

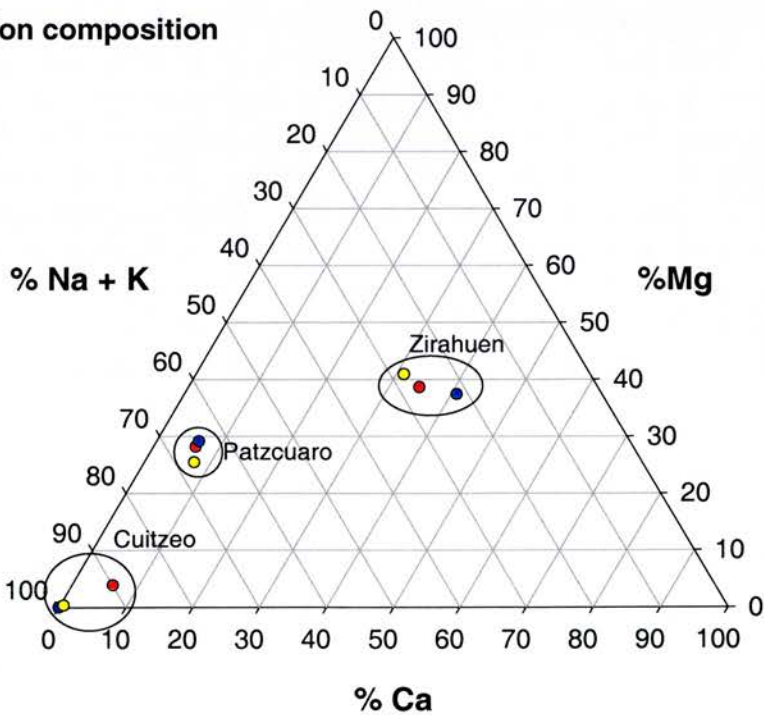


**Figure 5.6:** Relationship between Na and (a) Cl, (b) K, (c) HCO<sub>3</sub> + CO<sub>3</sub> and (d) SO<sub>4</sub>.

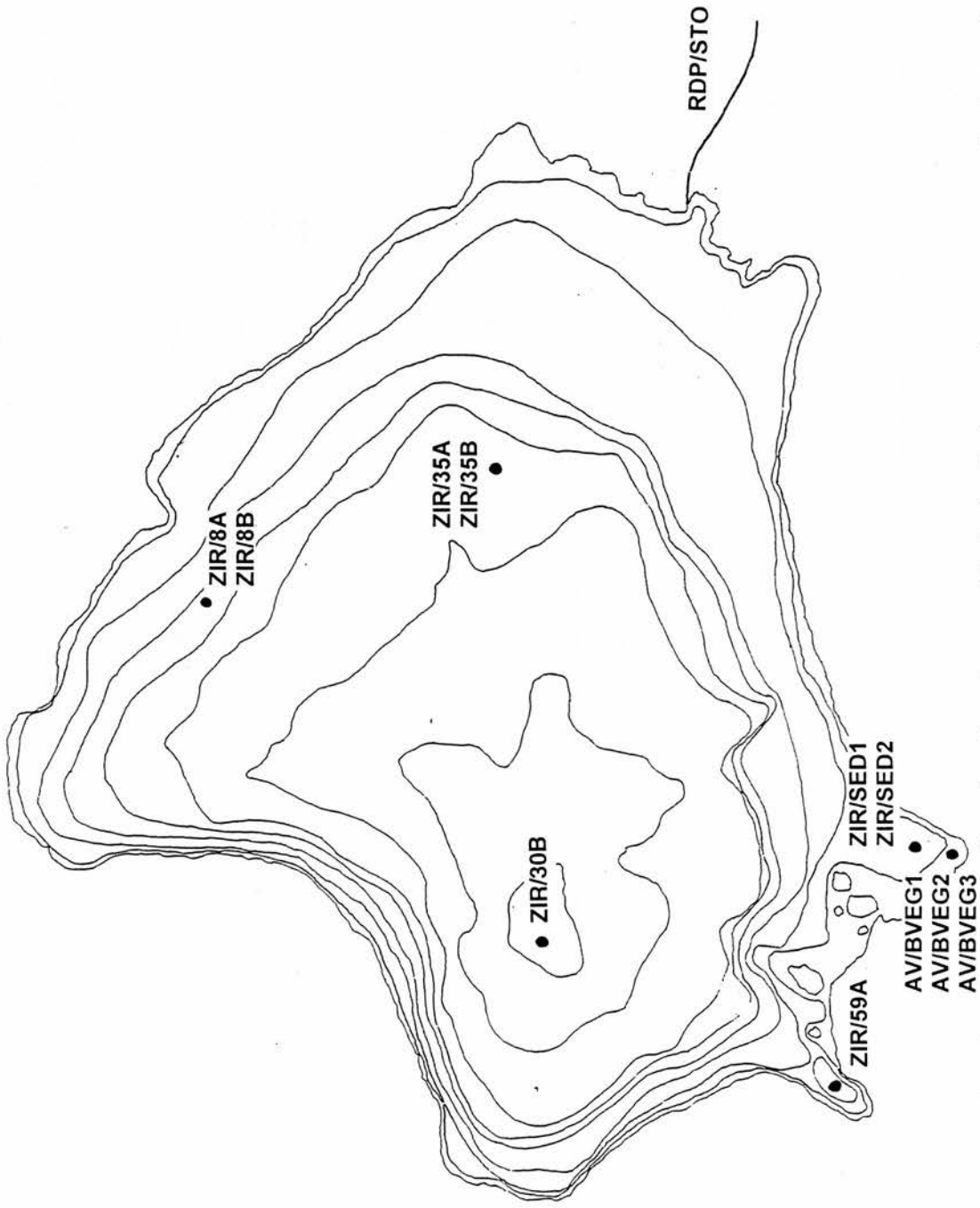
a) Anion composition



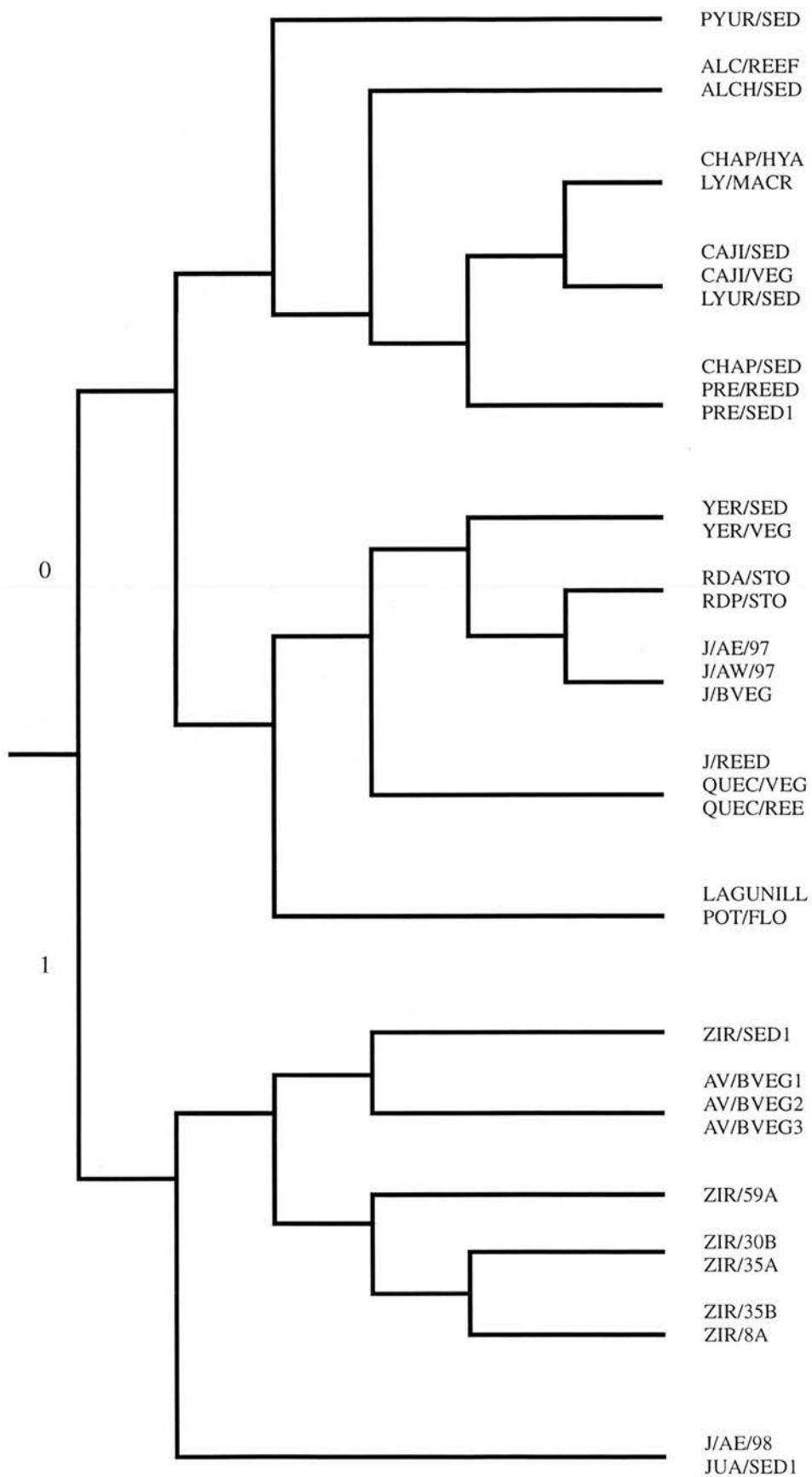
b) Cation composition



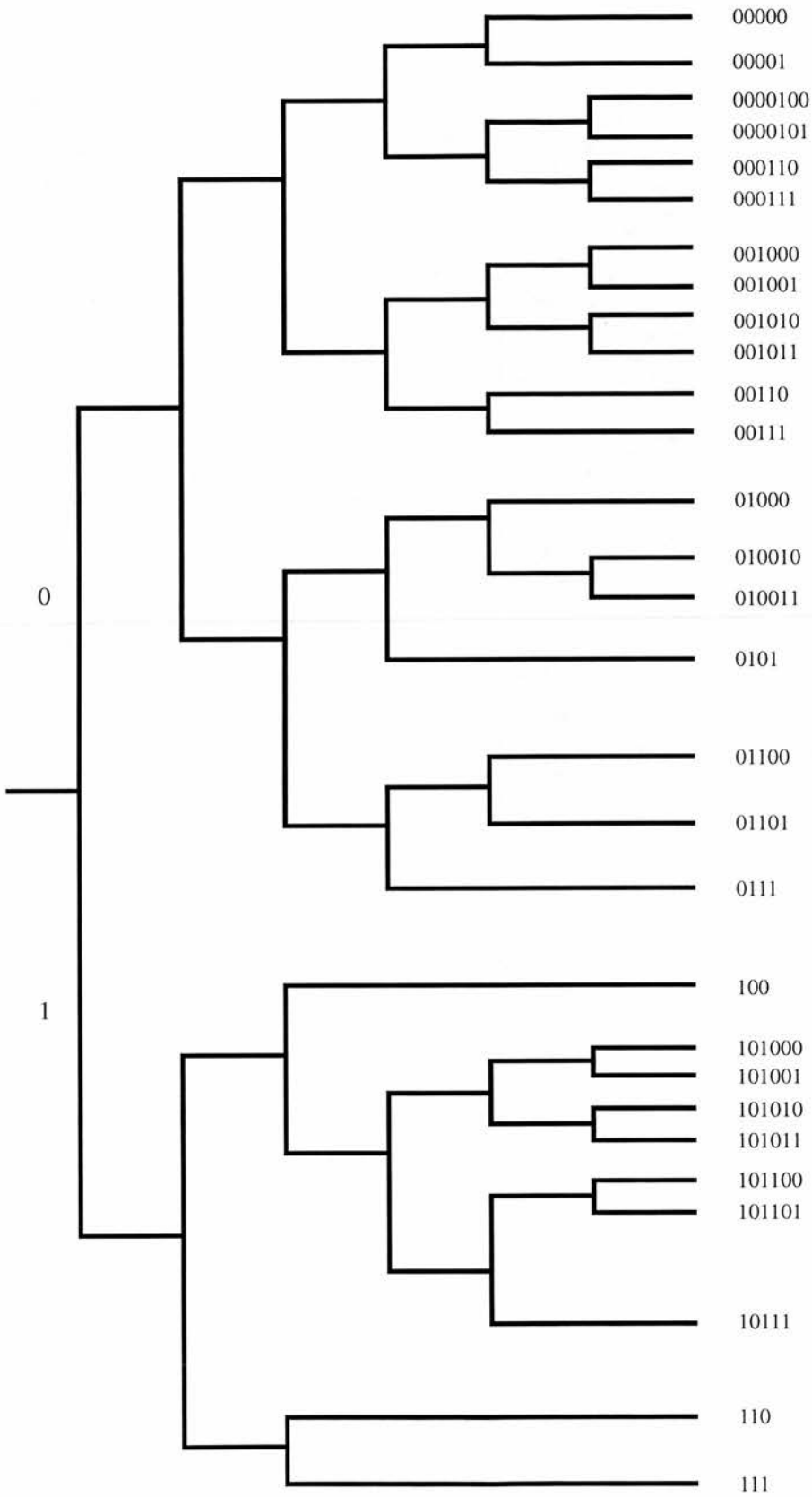
**Figure 5.7:** Comparison of water chemistry data for Lago de Zirahuén, Lago de Patzcuaro and Lago de Cuitzeo from this study (red), 1982 data (Metcalf, 1985) and 1973 data (Bradbury, unpubl., cited in Metcalf, 1985).



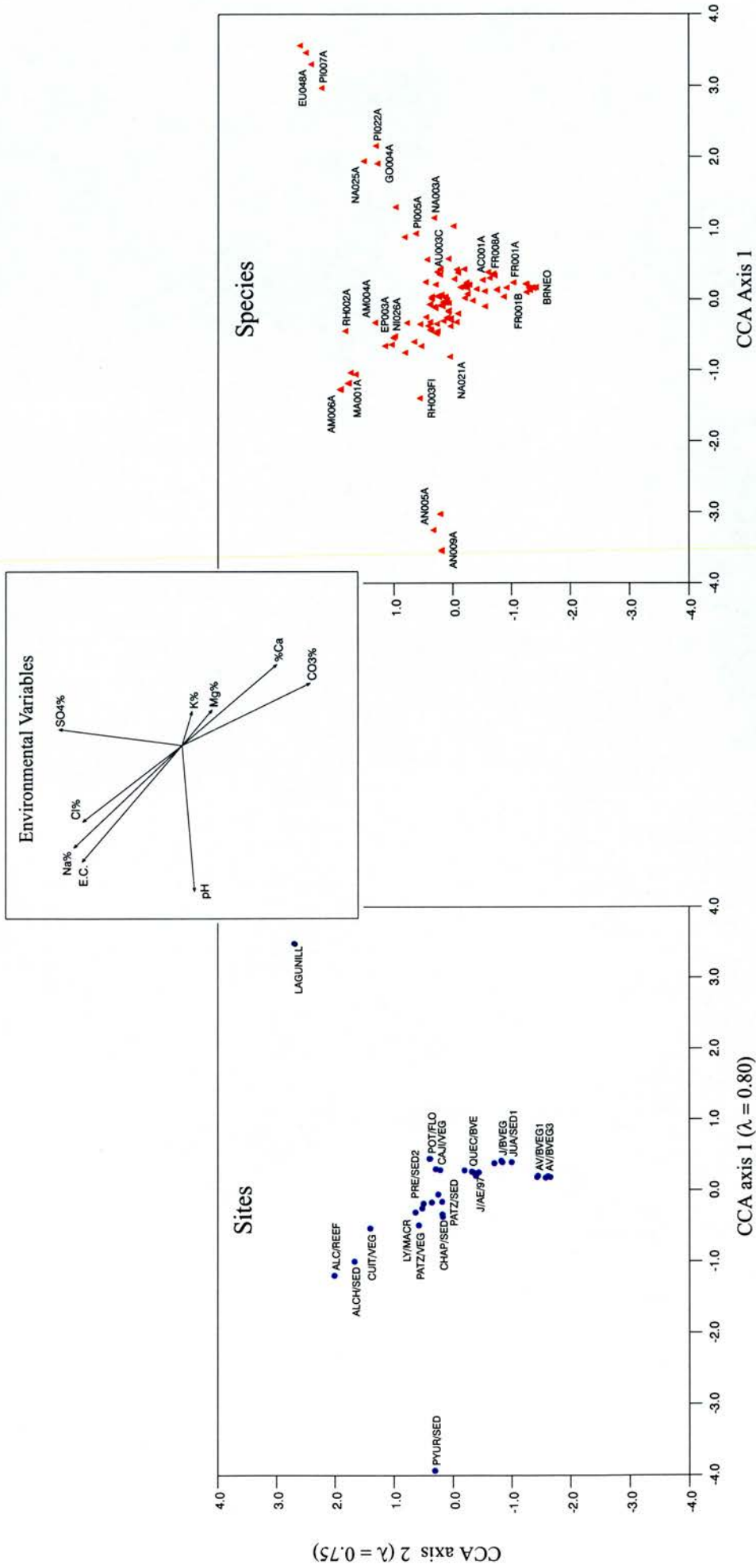
**Figure 5.8:** Location of modern diatom samples taken from Laguna Zirahuén. Bathymetric contours are at 5m intervals.



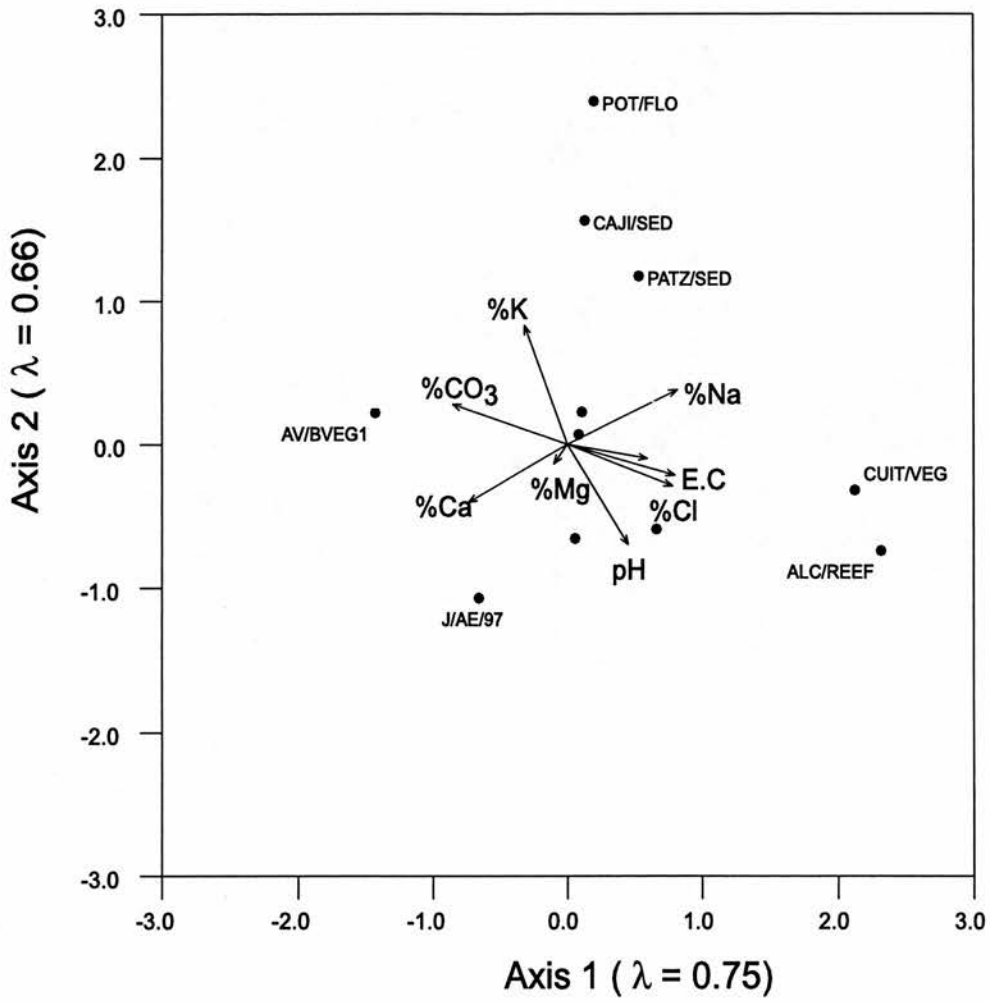
**Figure 5.9:** TWINSpan classification of modern diatom samples.



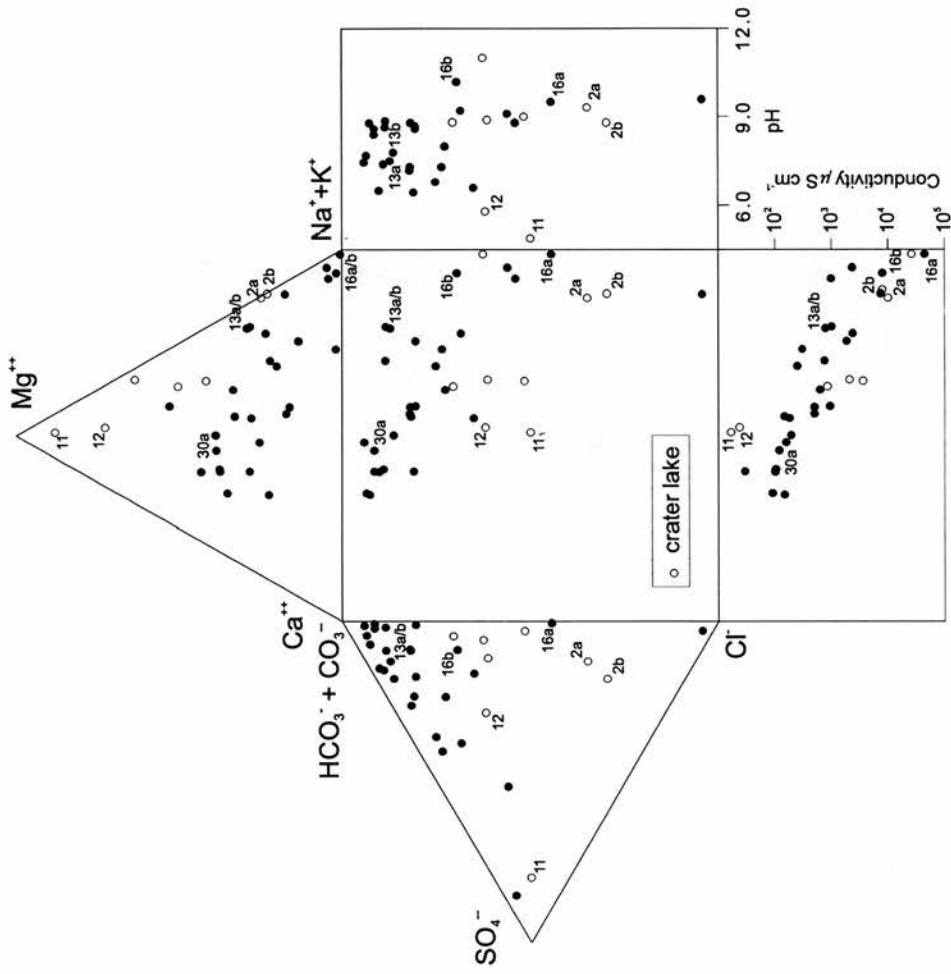
**Figure 5.10:** TWINSpan classification of diatom species from central Mexican lakes.



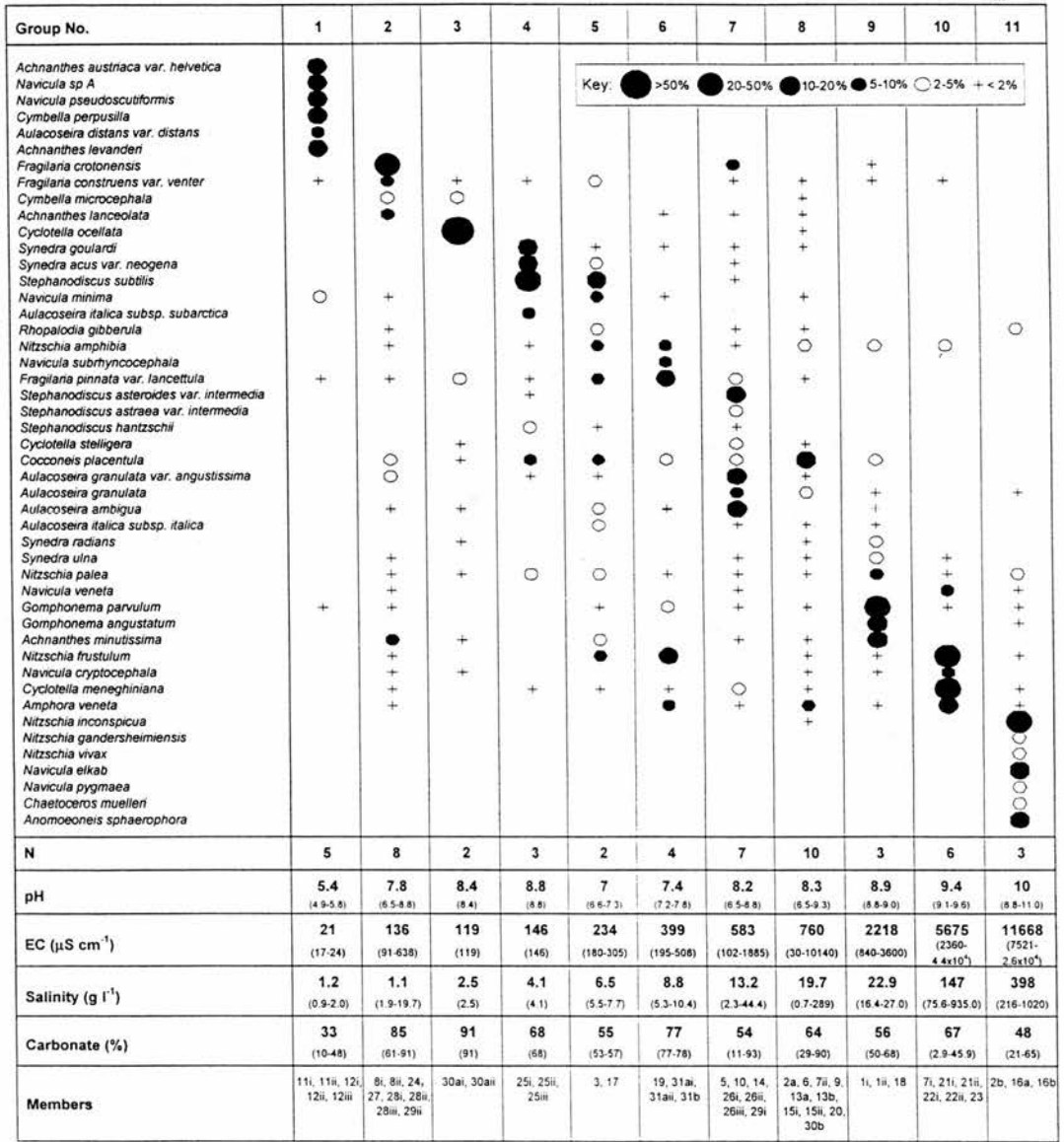
**Figure 5.11:** CCA ordination biplot showing configuration of samples, species and environmental variables on axes 1 and 2.



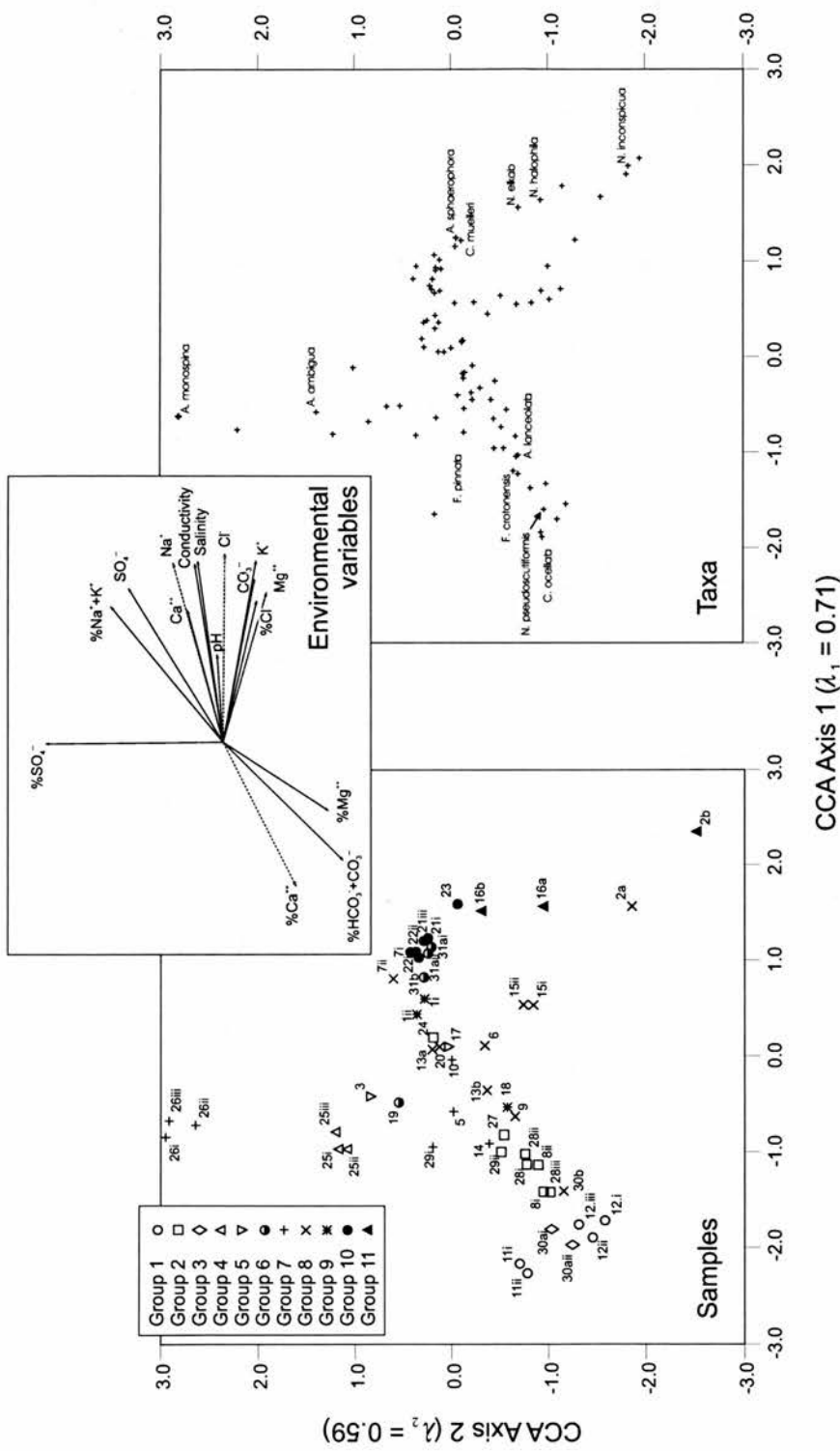
**Figure 5.12:** Biplot of samples and environmental variables with Lagunilla de San Gregorio and La Piscina de Yuriria removed from the CCA.



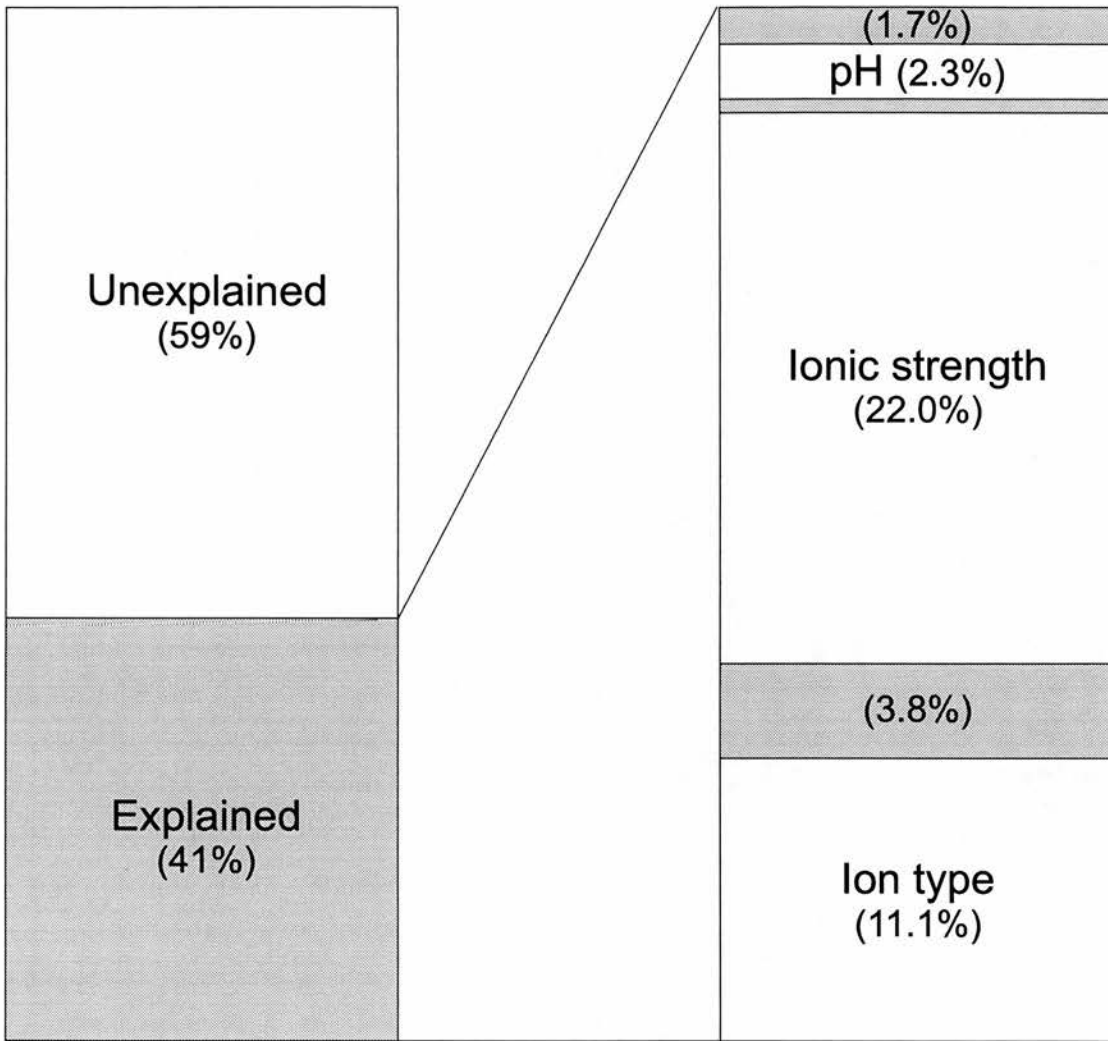
**Figure 5.13:** Durov diagram showing ionic composition, pH and conductivity for the Central Mexican Dataset.  
See Table 5.5 for key to lake numbers.



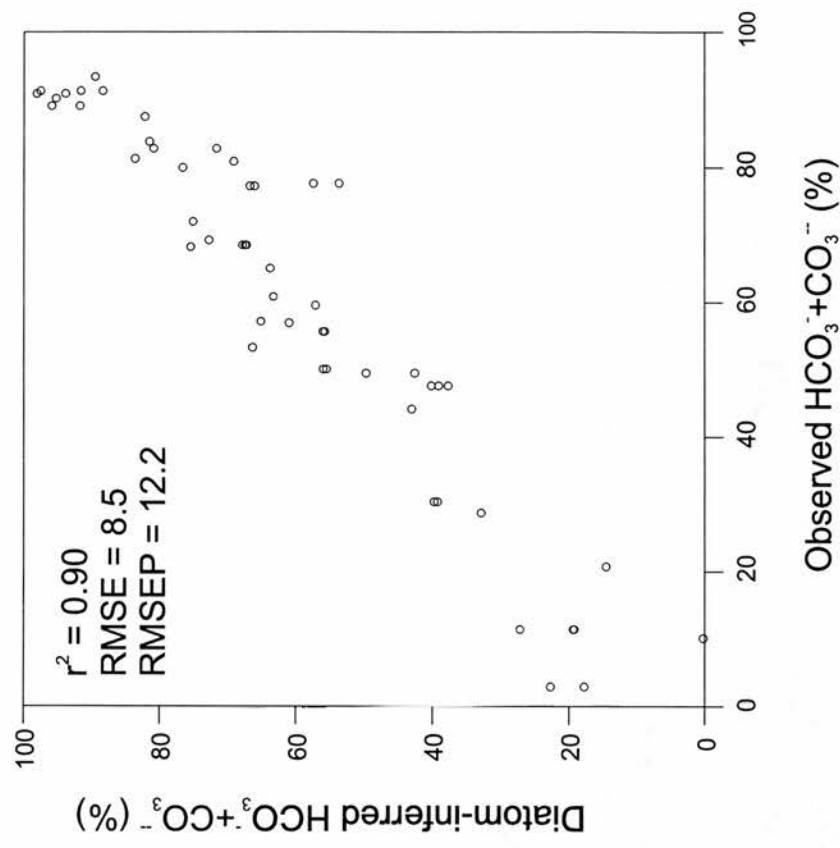
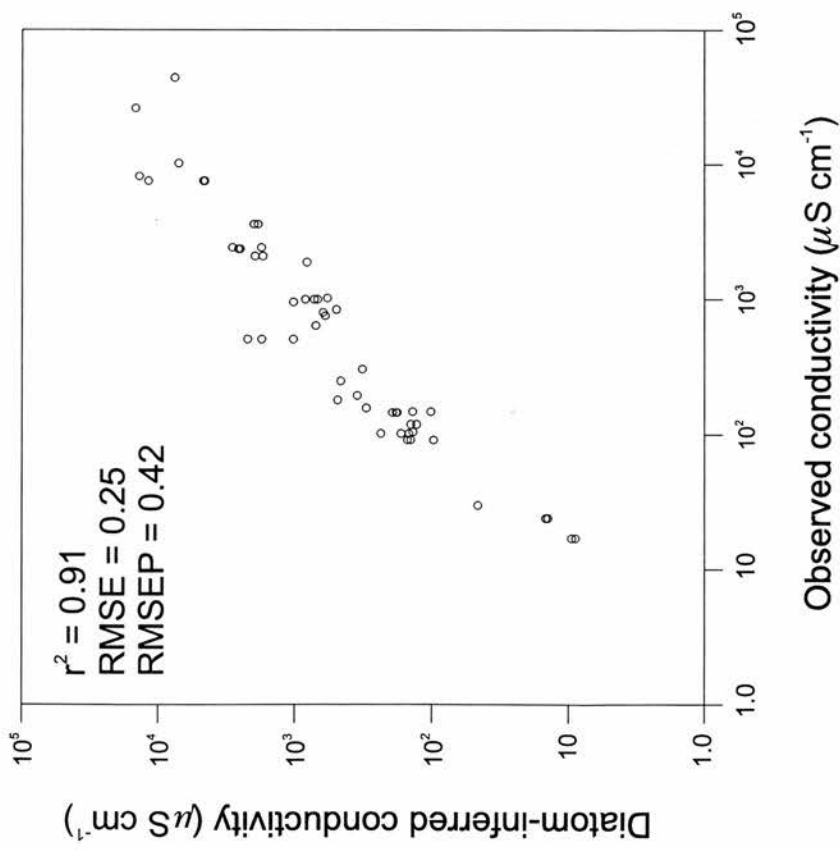
**Figure 5.14:** TWINSpan classification of the surface sediment diatom assemblages, showing for each group the number of sites (N), mean relative abundance of selected taxa, means and ranges for selected chemical variables and site membership.



**Figure 5.15:** CCA ordination biplot, showing configuration of samples, taxa and environmental variables on axes 1 and 2. Solid arrows represent variables used in the CCA, whilst dotted arrows represent variables added to the biplot *post-hoc*. See Table 5.5 for key to site numbers.



**Figure 5.16:** Results of the variance partitioning, showing the percentage variance accounted for by unique contributions of pH, ionic strength and ion type. Shaded areas represent interactions or conditional effects between gradients.



**Figure 5.17:** Relationship between observed and diatom-inferred conductivity and alkalinity (%  $HCO_3^- + CO_3^{--}$ ).

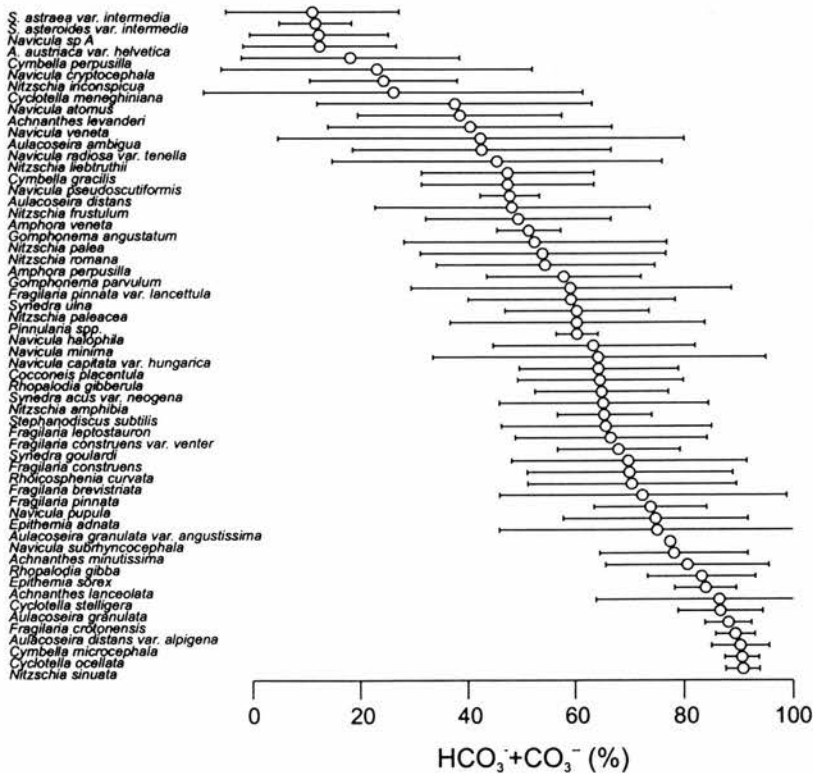
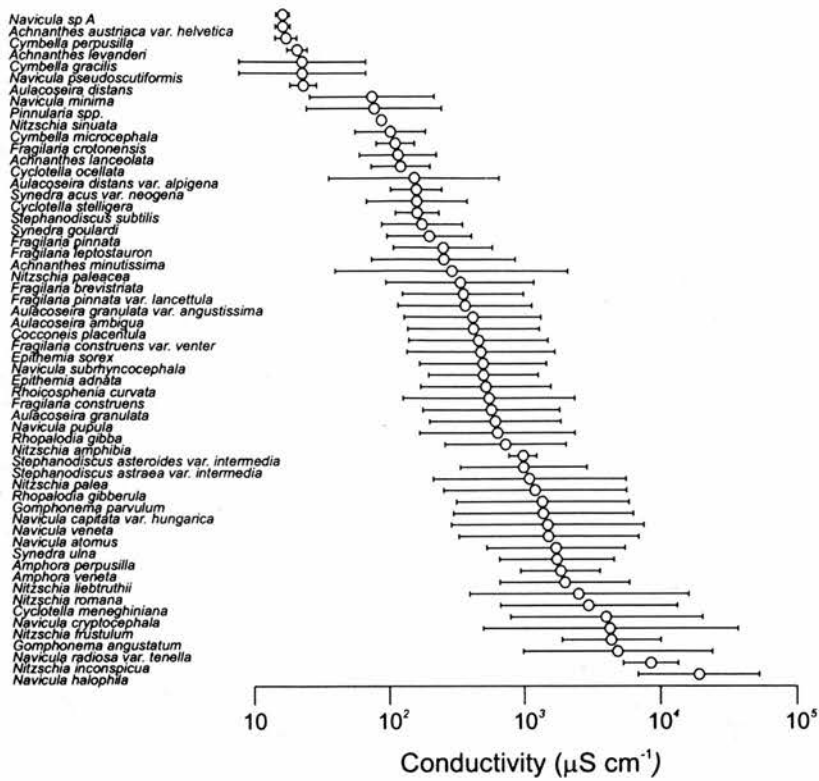
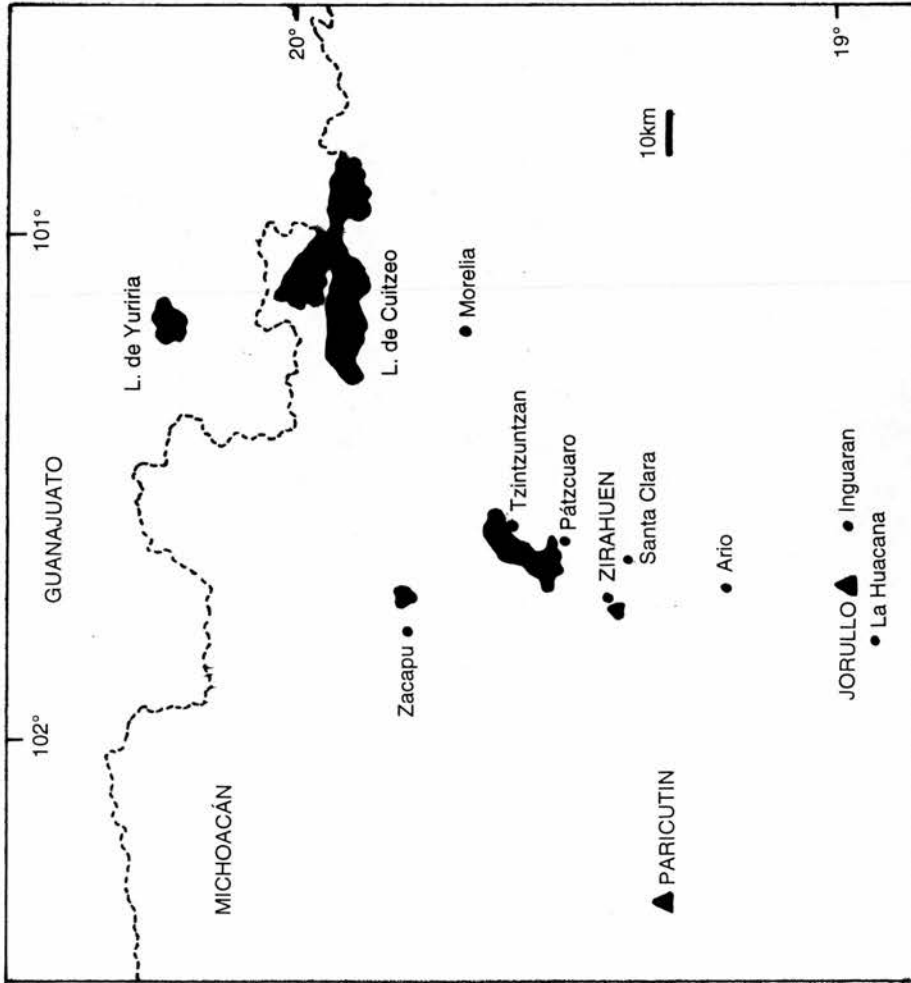
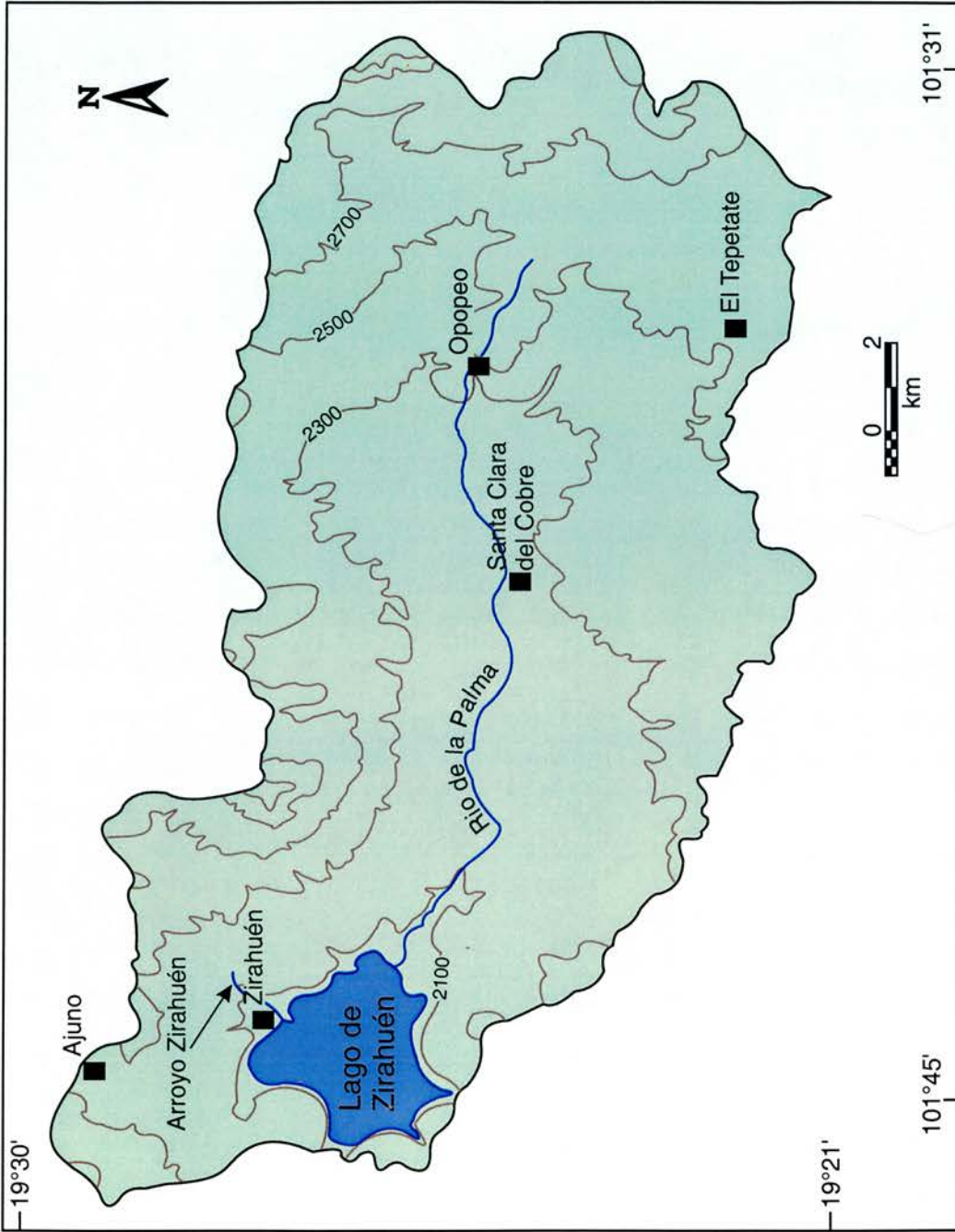


Figure 5.18: Conductivity and alkalinity ( $\text{HCO}_3^- + \text{CO}_3^{2-}$ ) optima and tolerances for selected taxa.



**Figure 6.1:** Location of the Zirahuén Basin and other sites mentioned in the text.



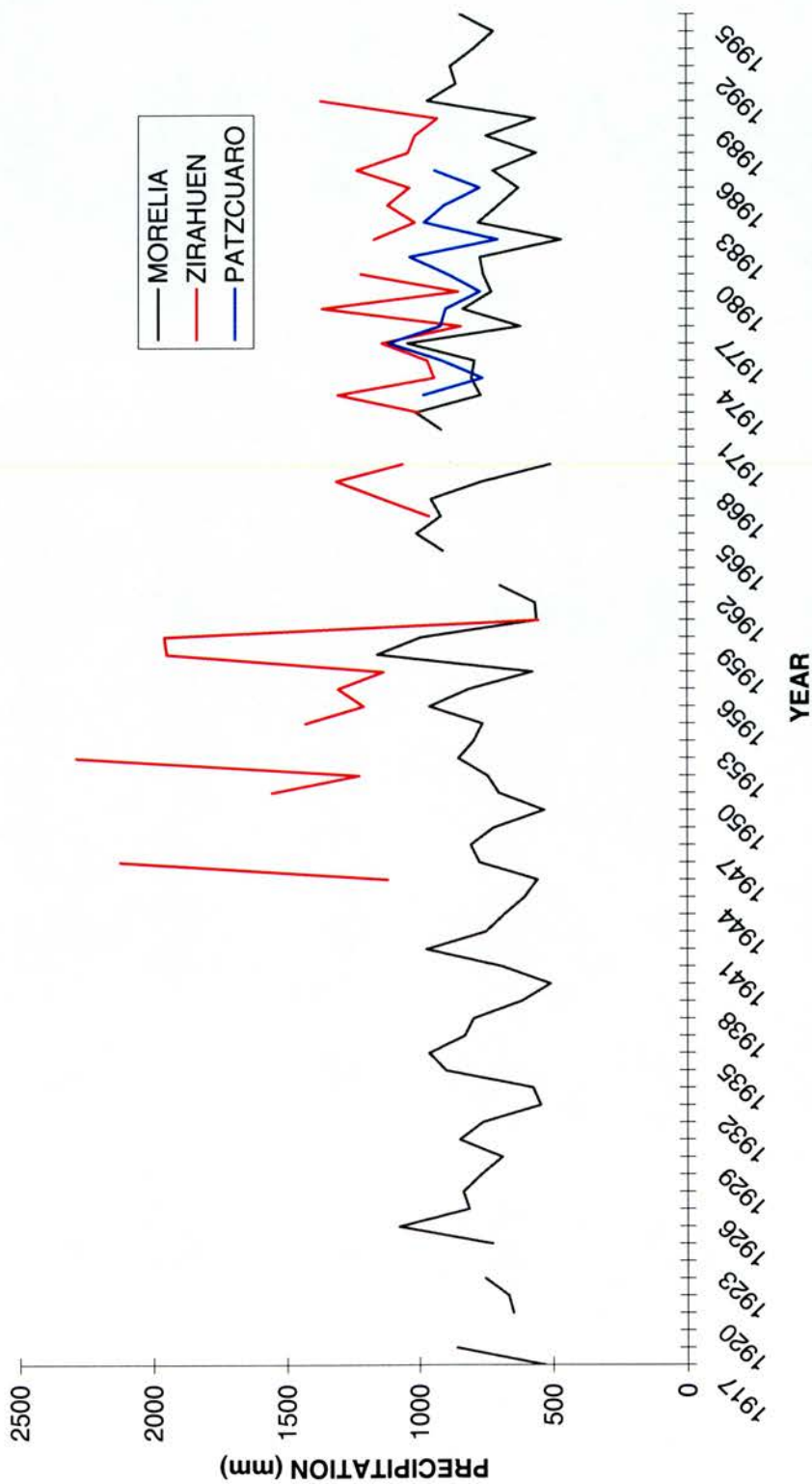
**Figure 6.2:** The Zirahuén Basin, illustrating principal settlements.



**Figure 6.3:** Aerial photograph illustrating the lava flow from Cerro La Magueyera, which blocked the Rio de la Palma. Cinder cones are marked with a red star.



**Figure 6.4:** Soil erosion around Lago de Zirahuén. Gabions have been put in place in an attempt to prevent further damage. The exposed soil is a distinctive red colour, being highly oxidised.



**Figure 6.5:** Annual precipitation records from the Zirahuén, Patzcuaro and Morelia meteorological stations. Records are discontinuous due to incomplete records.

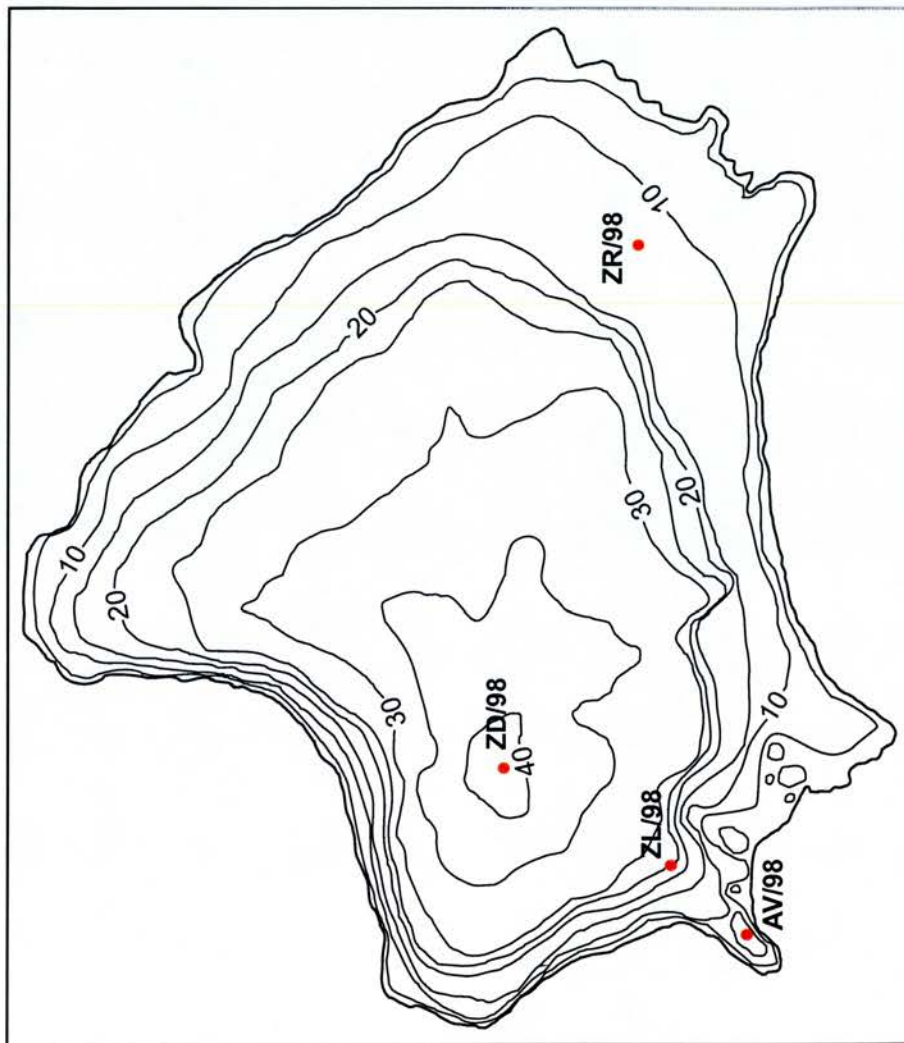


a) Dry Season: March 1998.

b) Wet Season: September 1998.



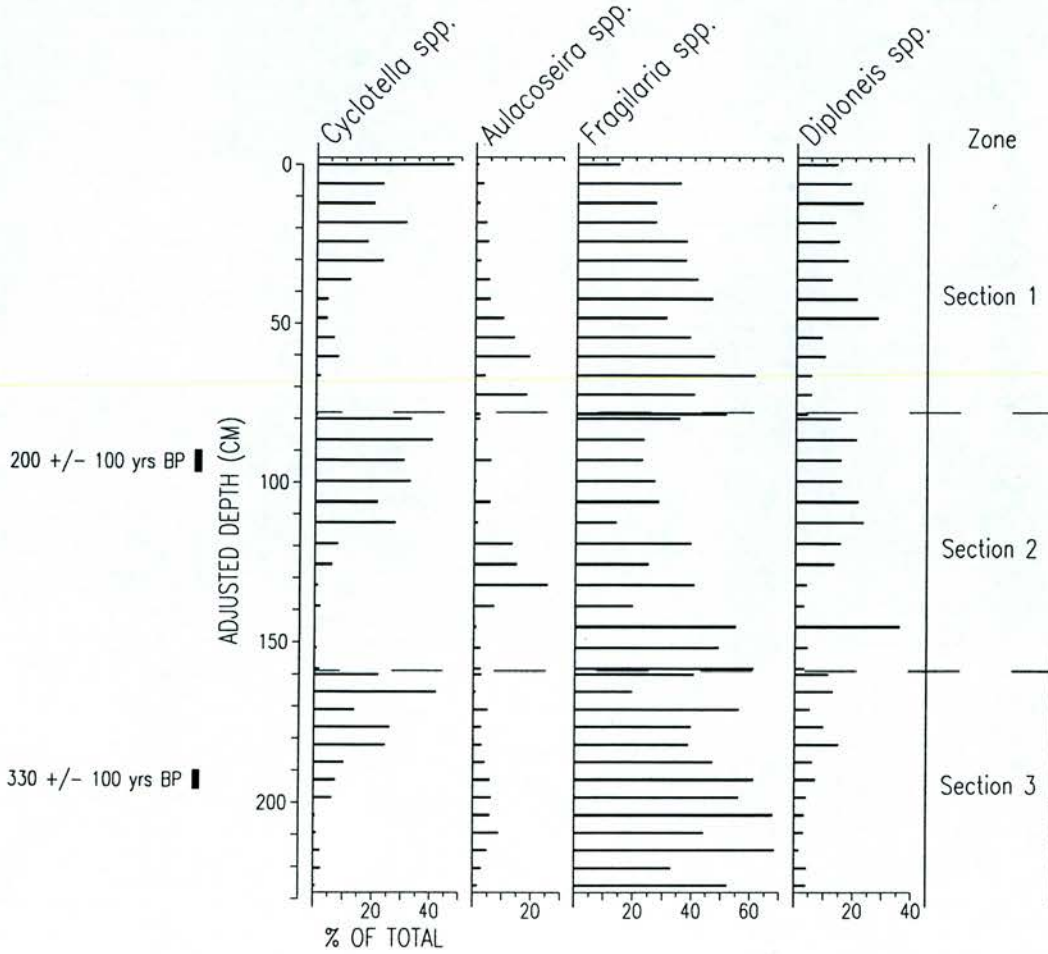
**Figure 6.6:** Seasonal differences in vegetation cover in the Zirahuen Basin.



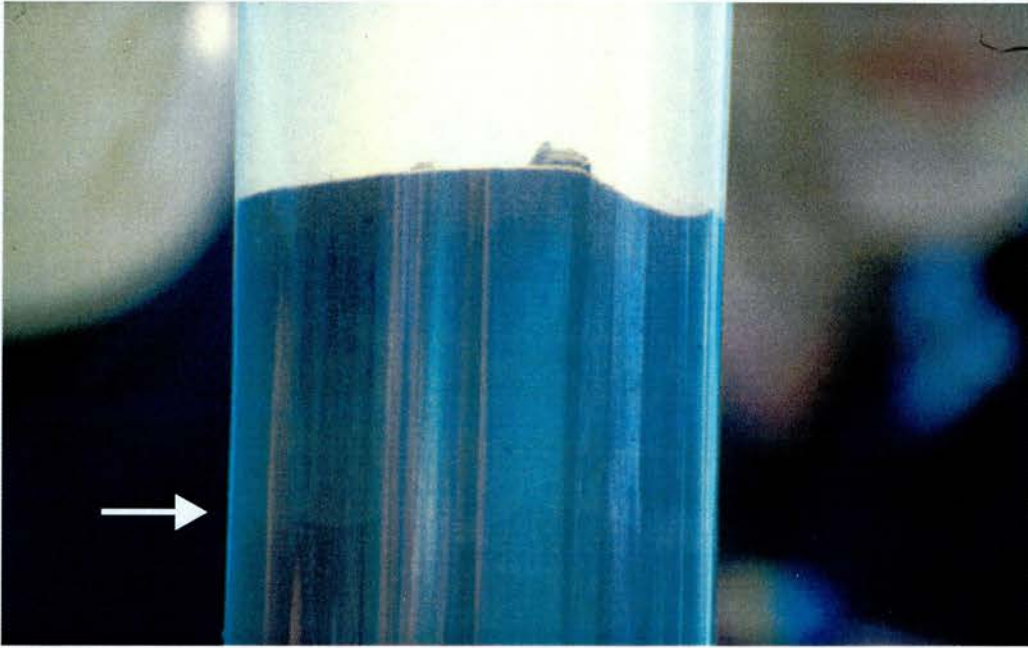
**Figure 6.7:** Bathymetry of Lago de Zirahuén (Chacon, unpubl.). Red circles represent core locations.



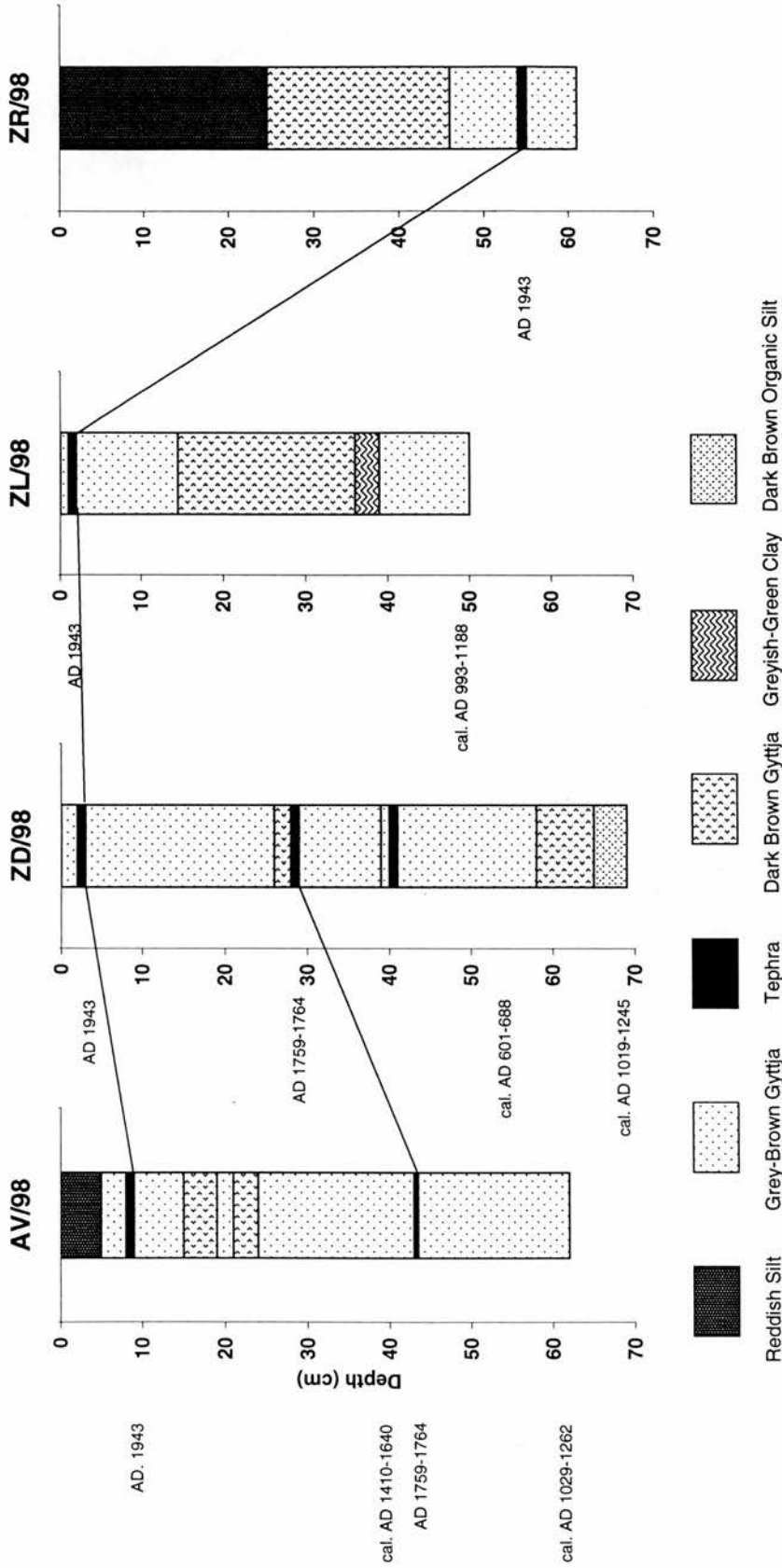
**Figure 6.8:** Photograph of sediment from the catchment entering Lago de Zirahuen.



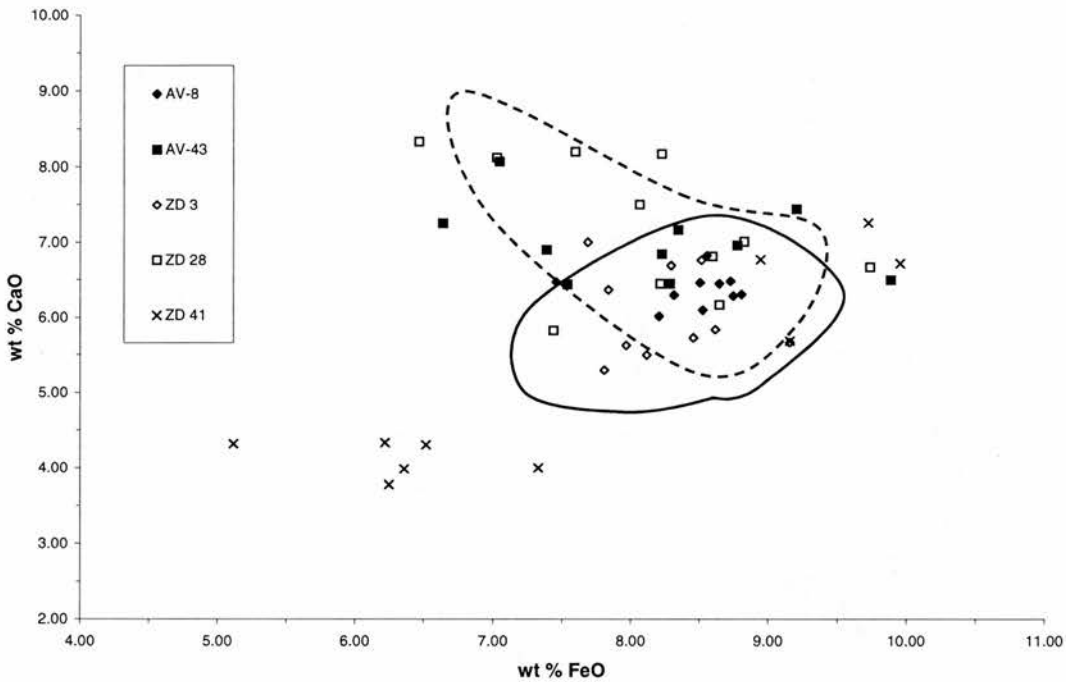
**Figure 6.9:** Summary diatom diagram for core ZIR/1



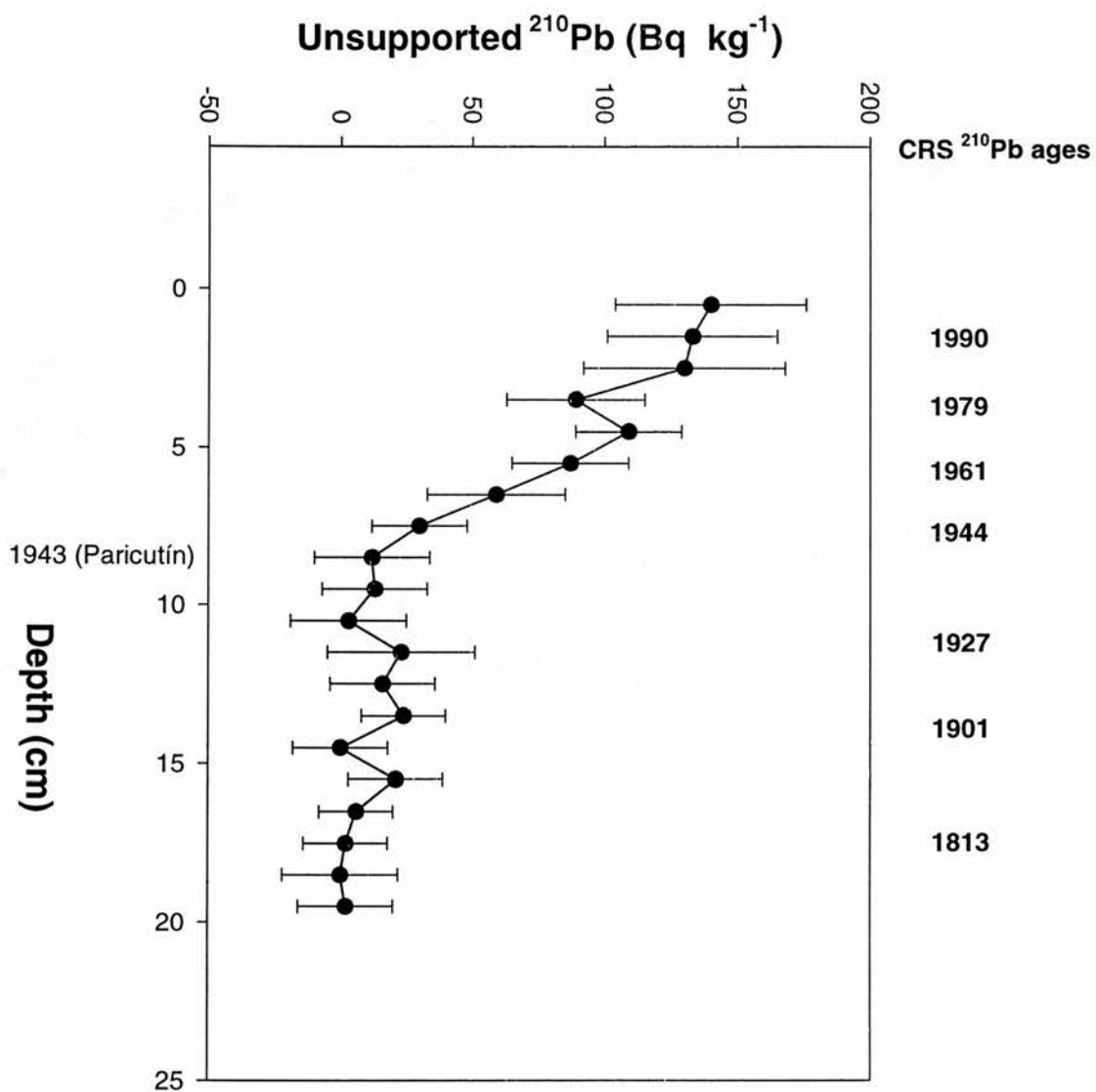
**Figure 6.10:** Close up of the sediment-water interface of core AV/98. The 5cm layer of silt at the top of the core, which was redder in colour than the rest of the core, is indicated by the arrow.



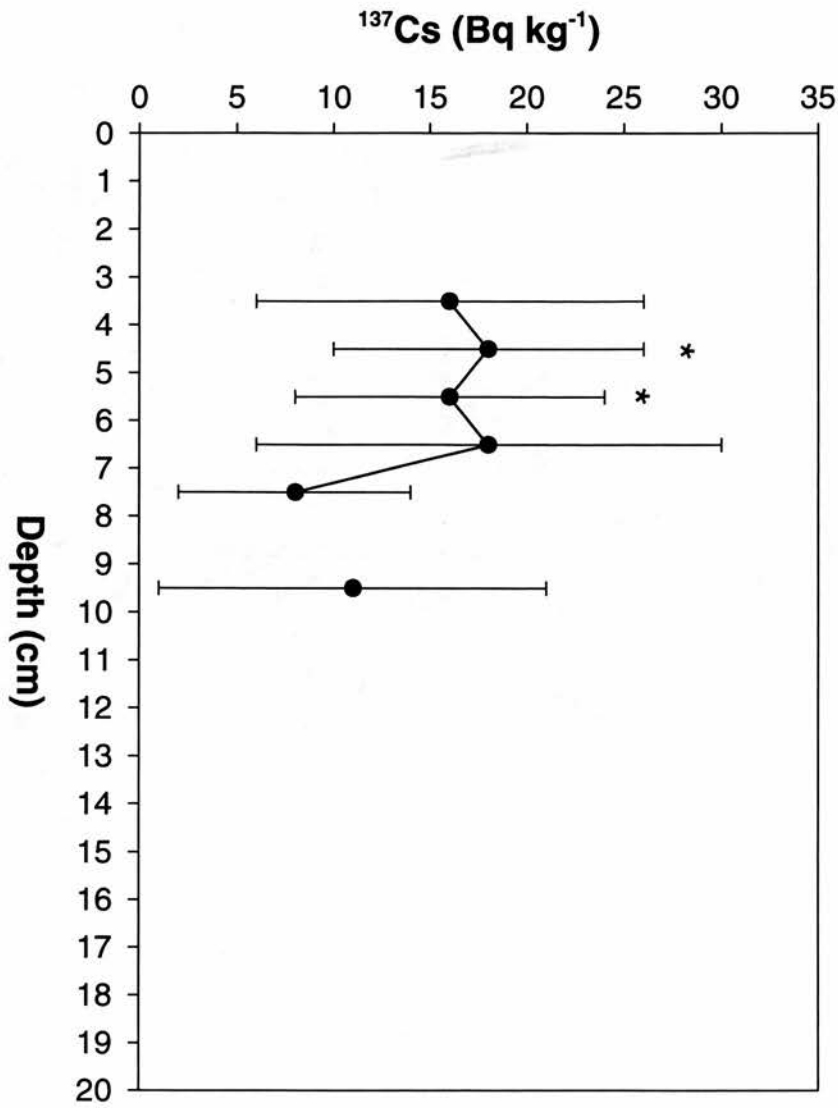
**Figure 6.11:** Stratigraphy and chronology of cores from Lago de Zirahuén



**Figure 6.12:** Results of the geochemical analysis of tephra layers from Lago de Zirahuén. The solid line indicates the spread of analyses of tephra layers from Paricutín and the dashed line represents the geochemical signature of Jorullo. For each tephra sample, several individual glass shards were analysed. Although there is an overlap between the two source volcanoes, it is clear that tephtras AV-8 and ZD-3 follow the same trend as the samples from Paricutín, whilst AV-43 and ZD-28 follow the same pattern as tephtra analysed from Jorullo. ZD-41 has a distinct geochemical composition and is not related to either source (Newton, unpubl. data).



**Figure 6.13:** Unsupported <sup>210</sup>Pb activity in core AV/98. Error bars are marked at the 2 sigma level.



**Figure 6.14:** Profile of  $^{137}\text{Cs}$  in core AV/98. The asterisks indicate the presence of  $^{241}\text{Am}$  at the detection limit.

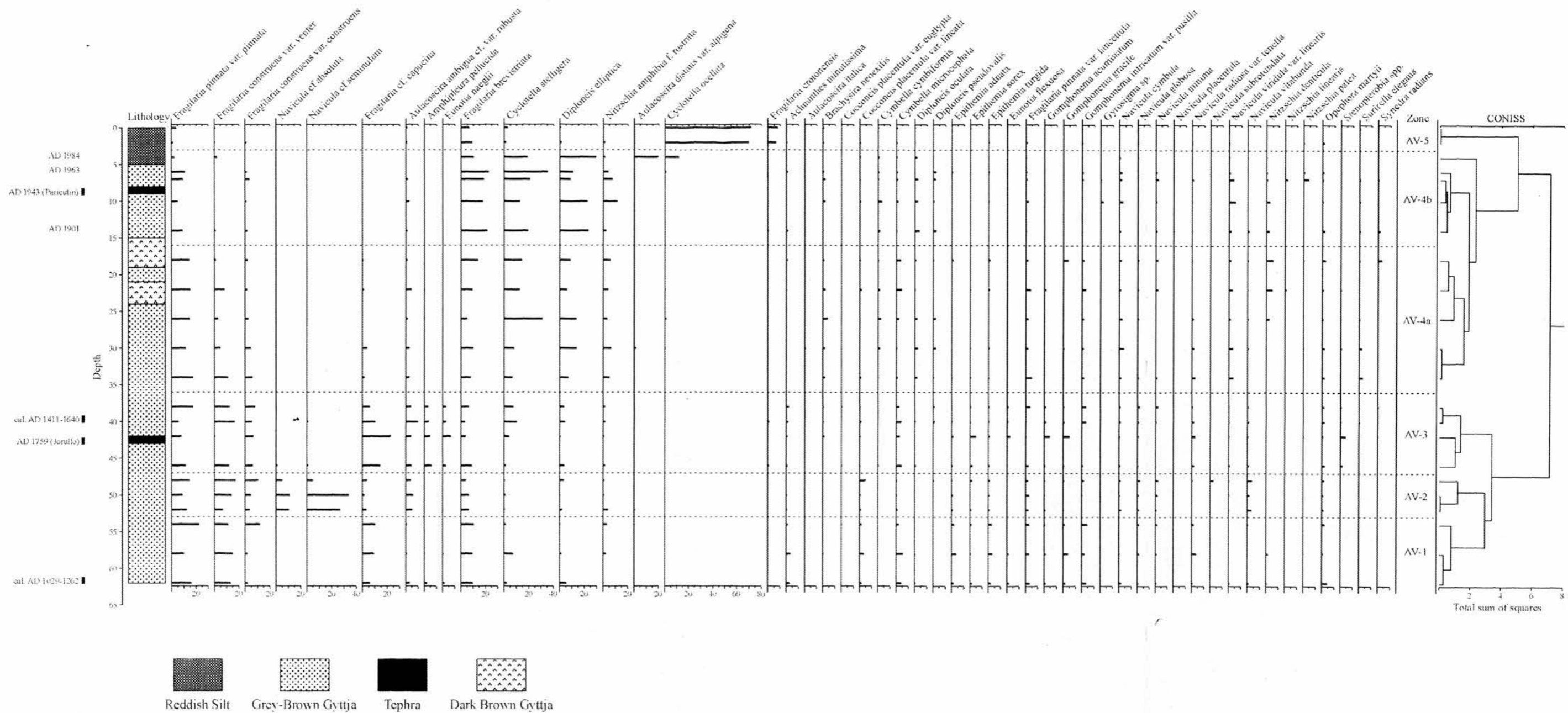
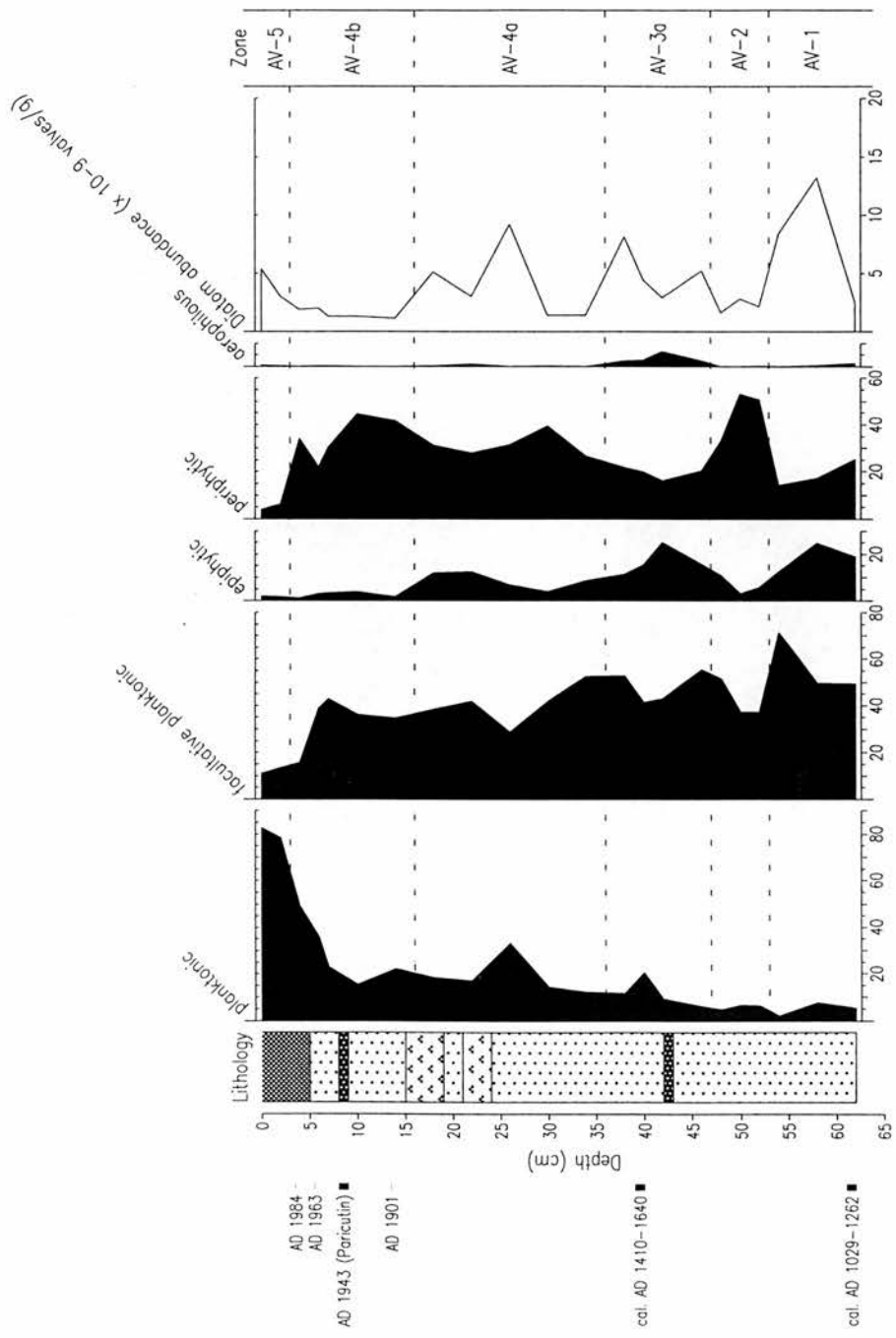


Figure 6.15: Diatom diagram for core AV/98, Lago de Zirahuén.



**Figure 6.16:** Diatom habitat groupings and diatom abundance, core AV/98

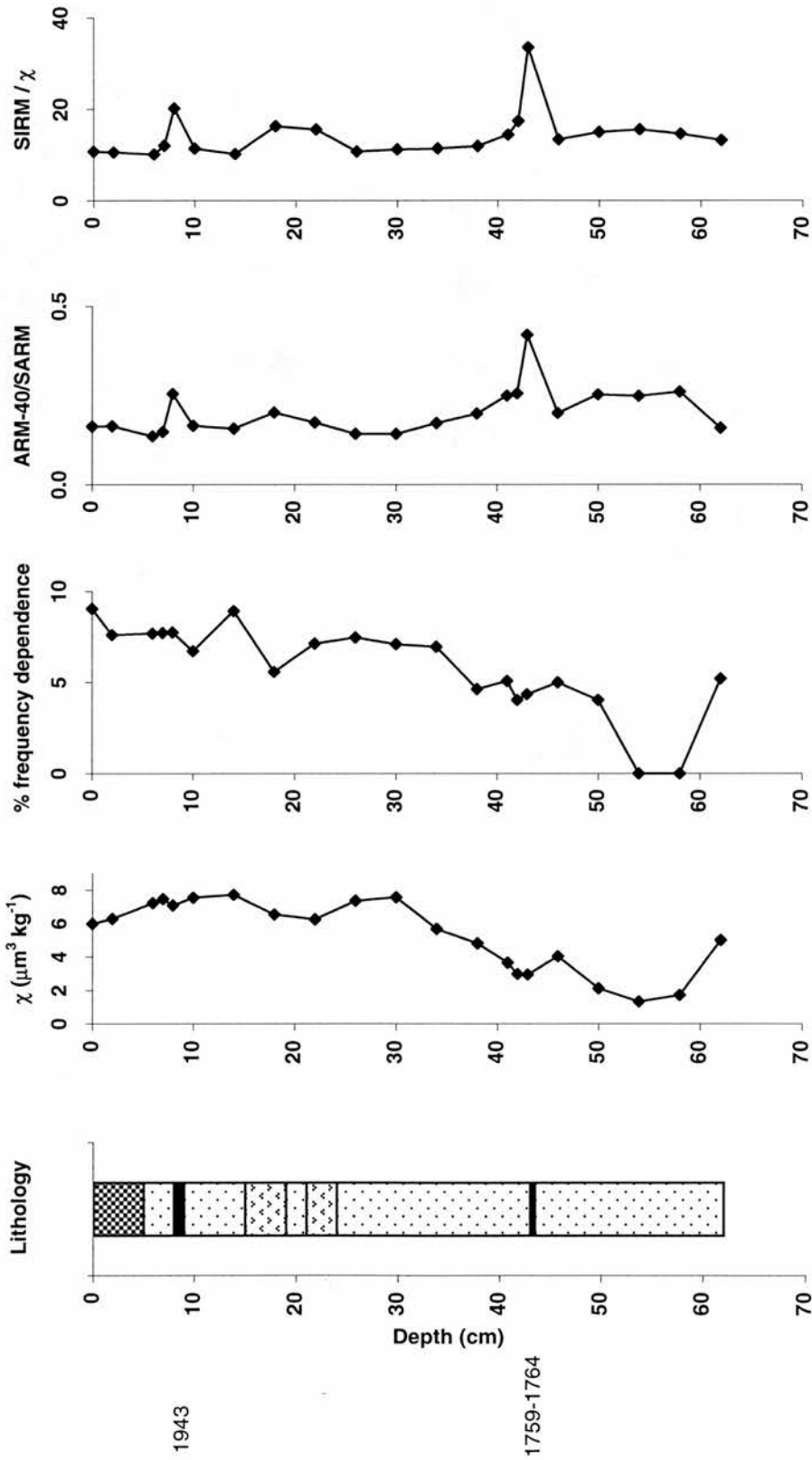


Figure 6.17: Mineral magnetic properties in core AV/98. Refer to Figure 6.15 for key to lithology.

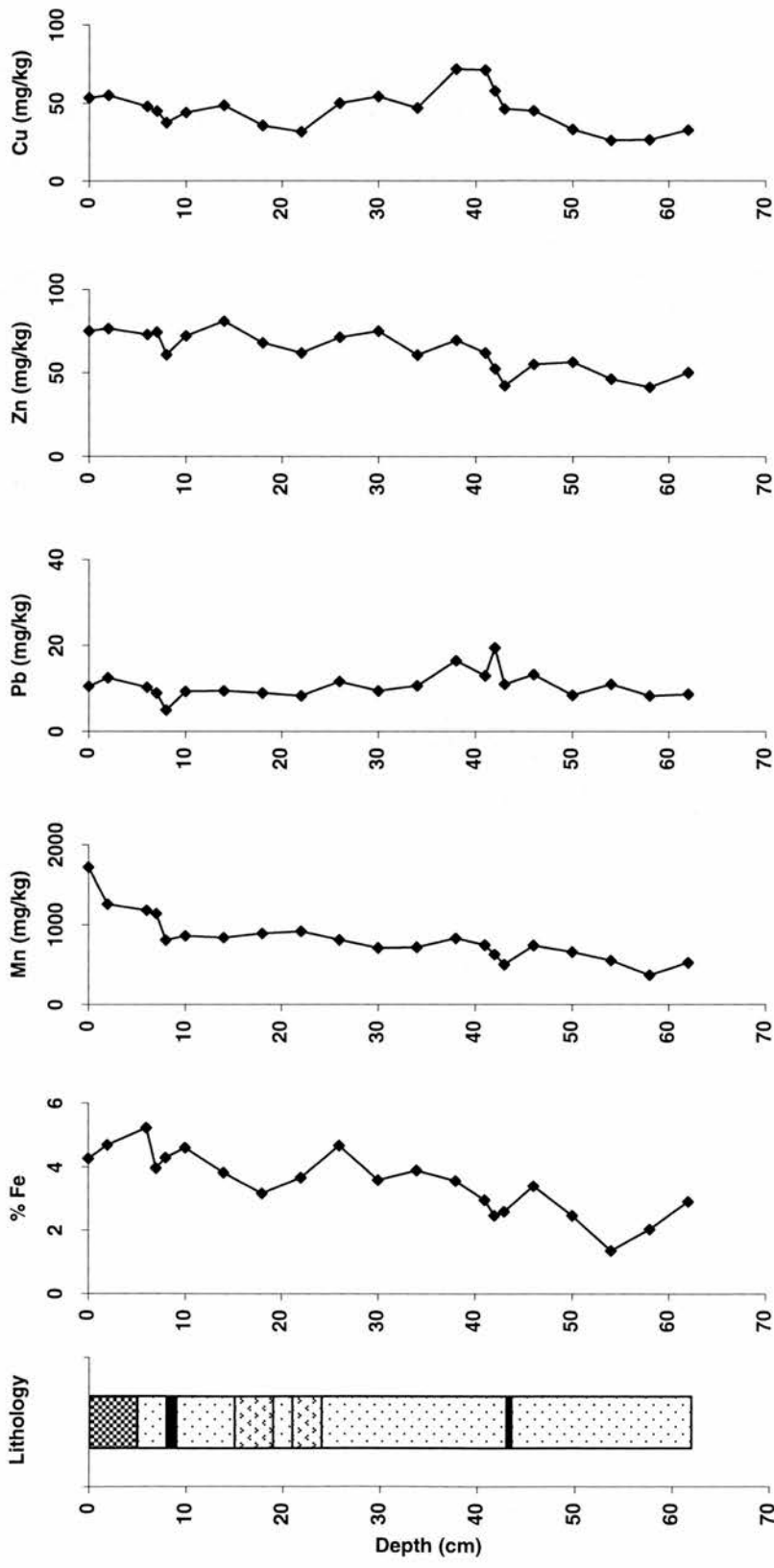
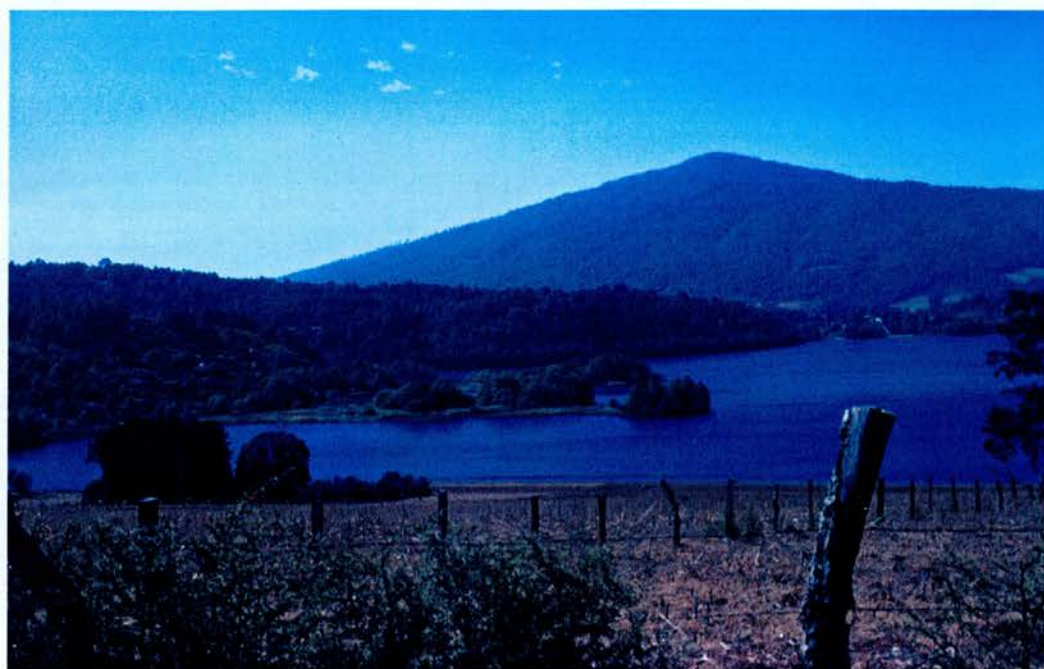


Figure 6.18: Metal concentrations in core AV/98. Refer to Figure 6.15 for lithology key.



**Figure 6.19:** The islands at the western end of Lago de Zirahuen. Note the abundant emergent aquatic vegetation around the edges of these islands.



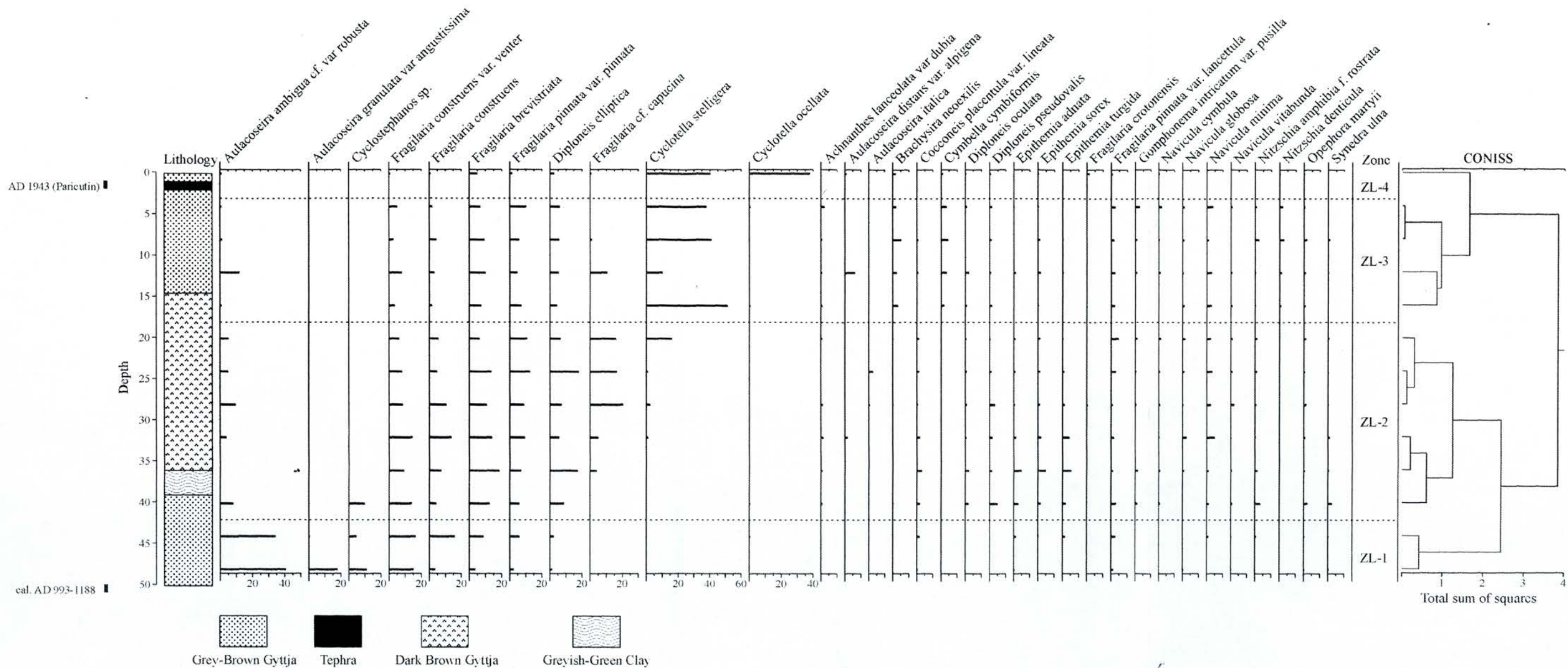


Figure 6.20: Diatom diagram for core ZL/98, Lago de Zirahuén

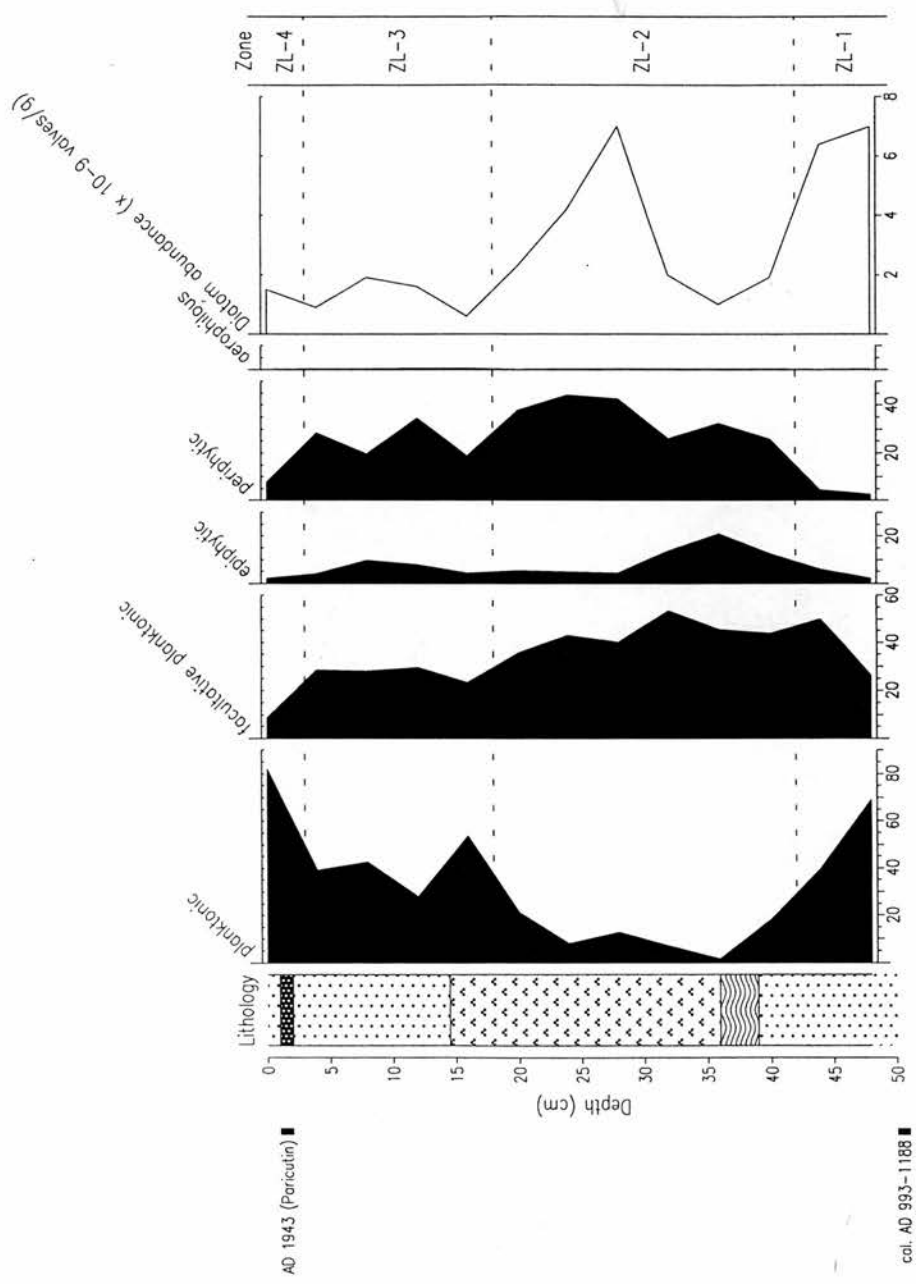
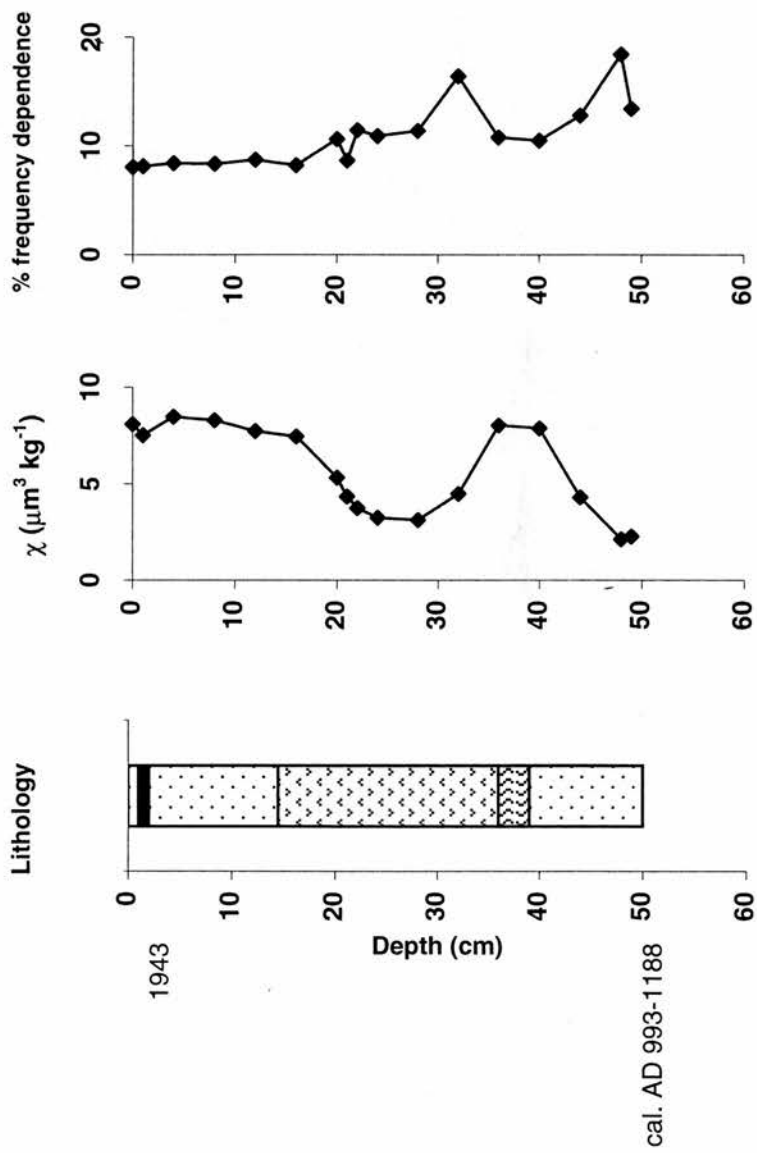


Figure 6.21: Diatom habitat groupings and diatom abundance, core ZL/98



**Figure 6.22:** Magnetic susceptibility, core ZL/98. Refer to Figure 6.20 for lithology key.

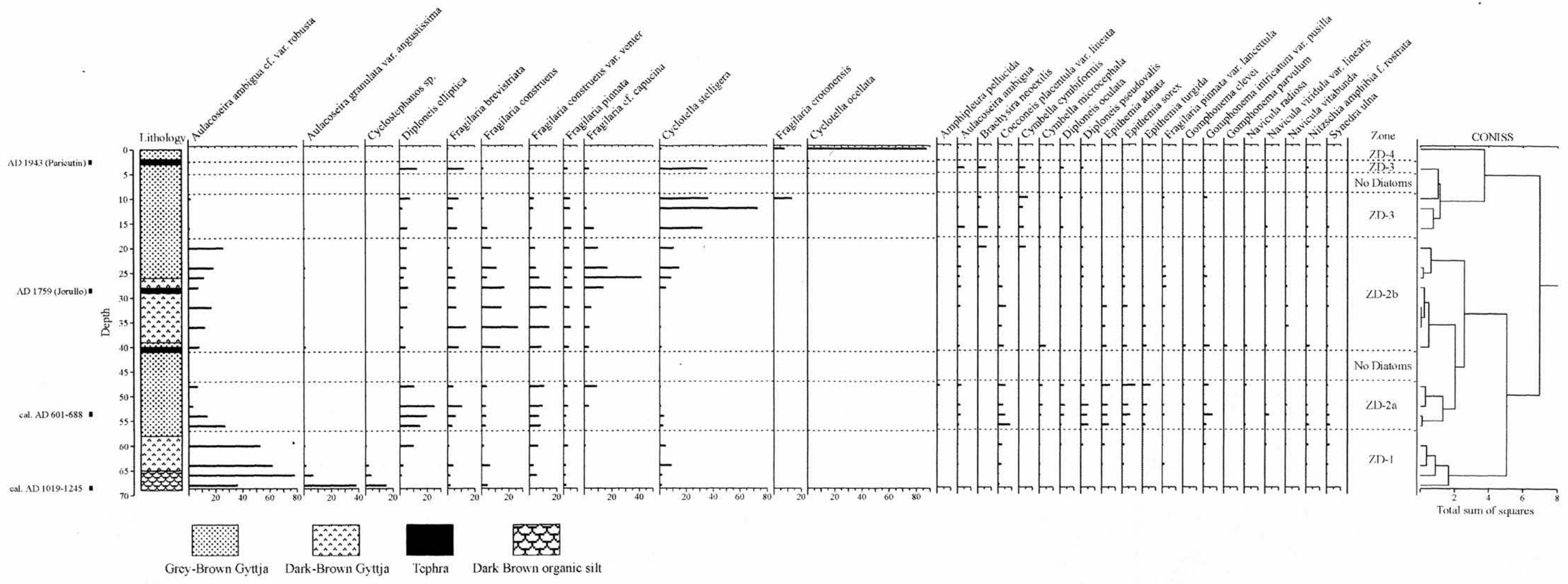


Figure 6.23: Diatom diagram for core ZD/98, Lago de Zirahuén

(6) / votes/ 10-8

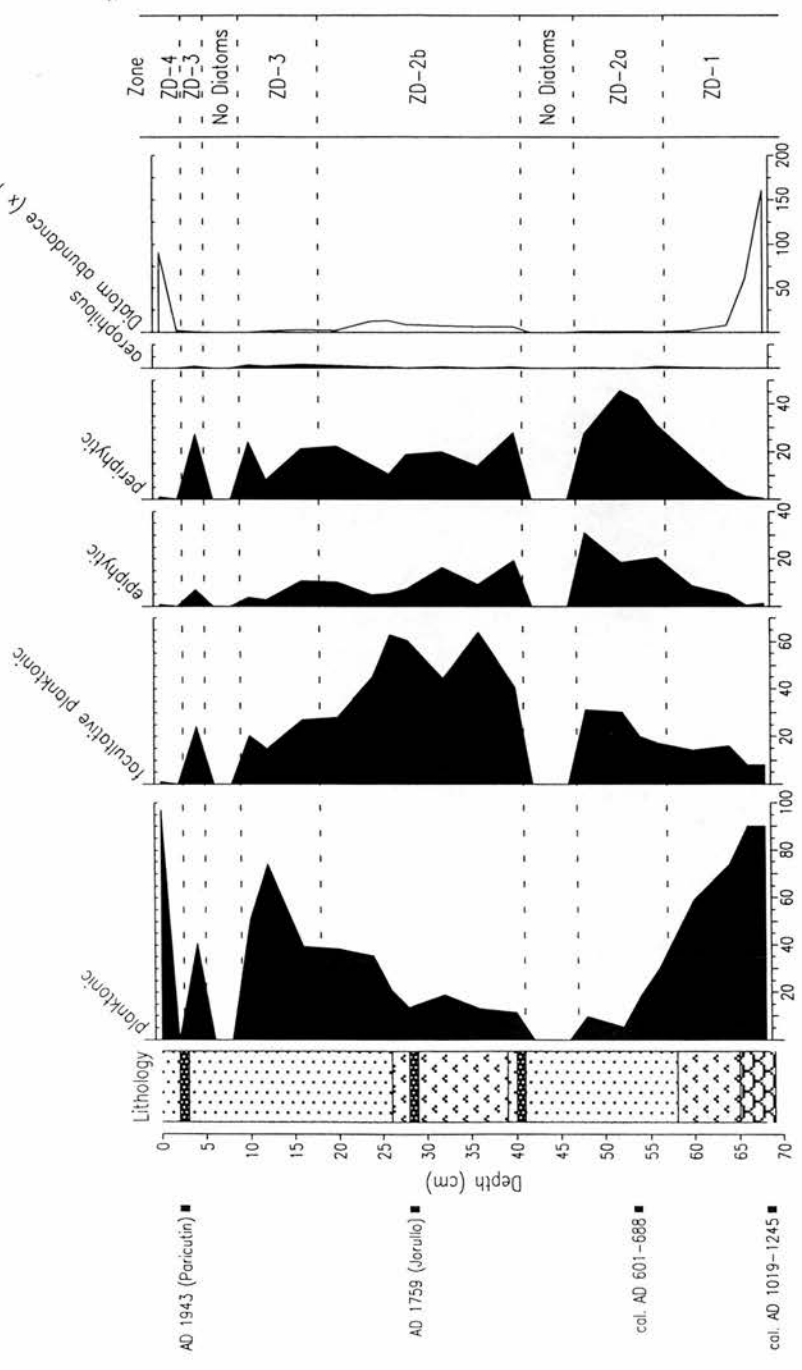
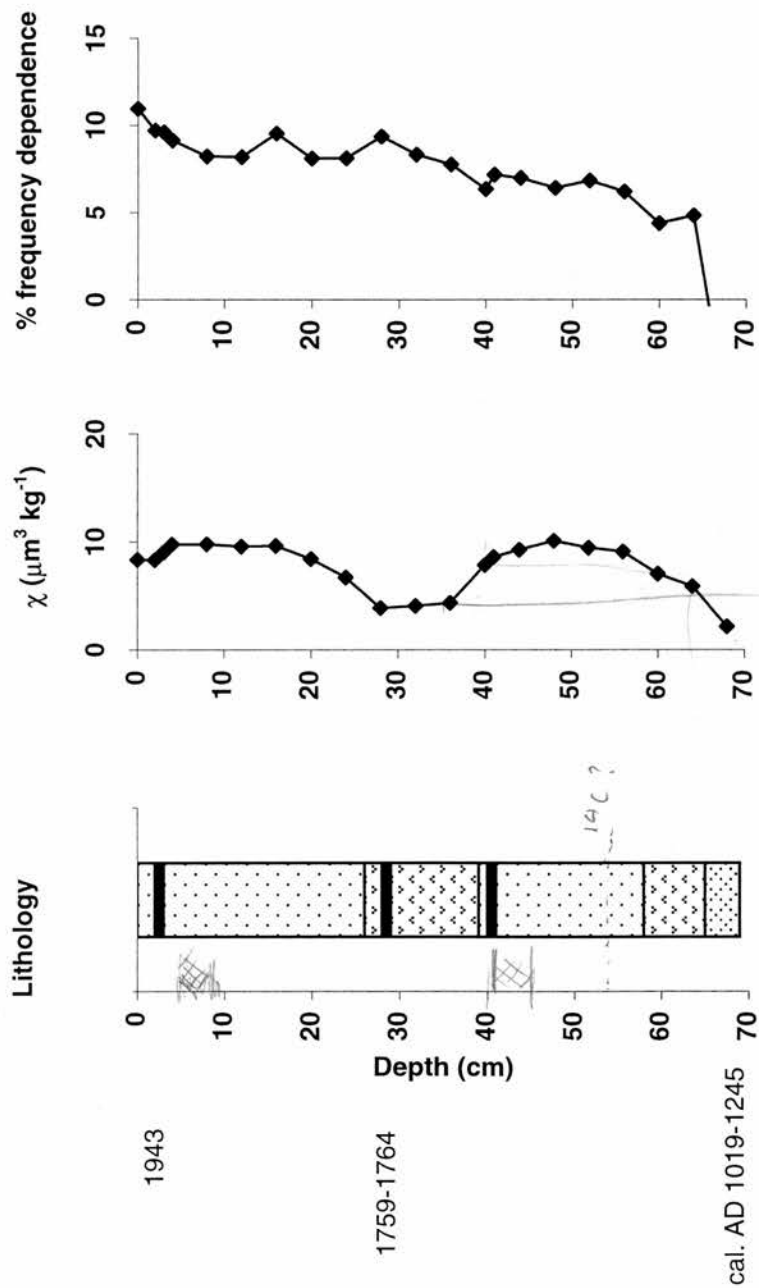


Figure 6.24: Diatom habitat groupings and diatom abundance, core ZD/98



**Figure 6.25:** Magnetic susceptibility for core ZD/98. Refer to Figure 6.23 for lithology key.

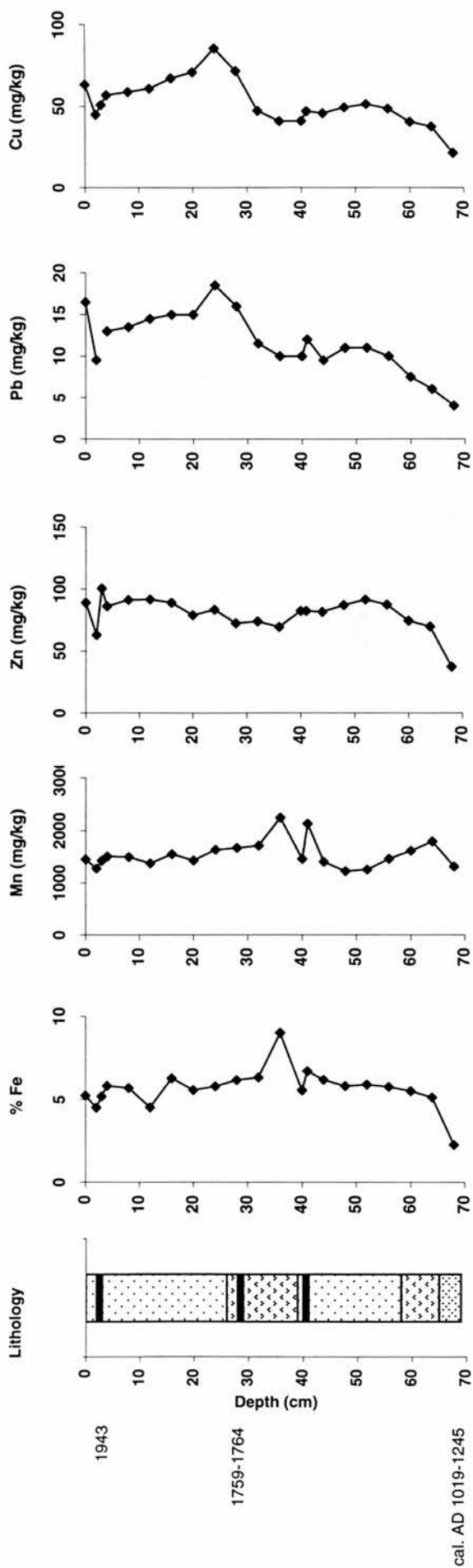


Figure 6.26: Metal concentrations in core ZD/98. Refer to Figure 6.23 for lithology key.

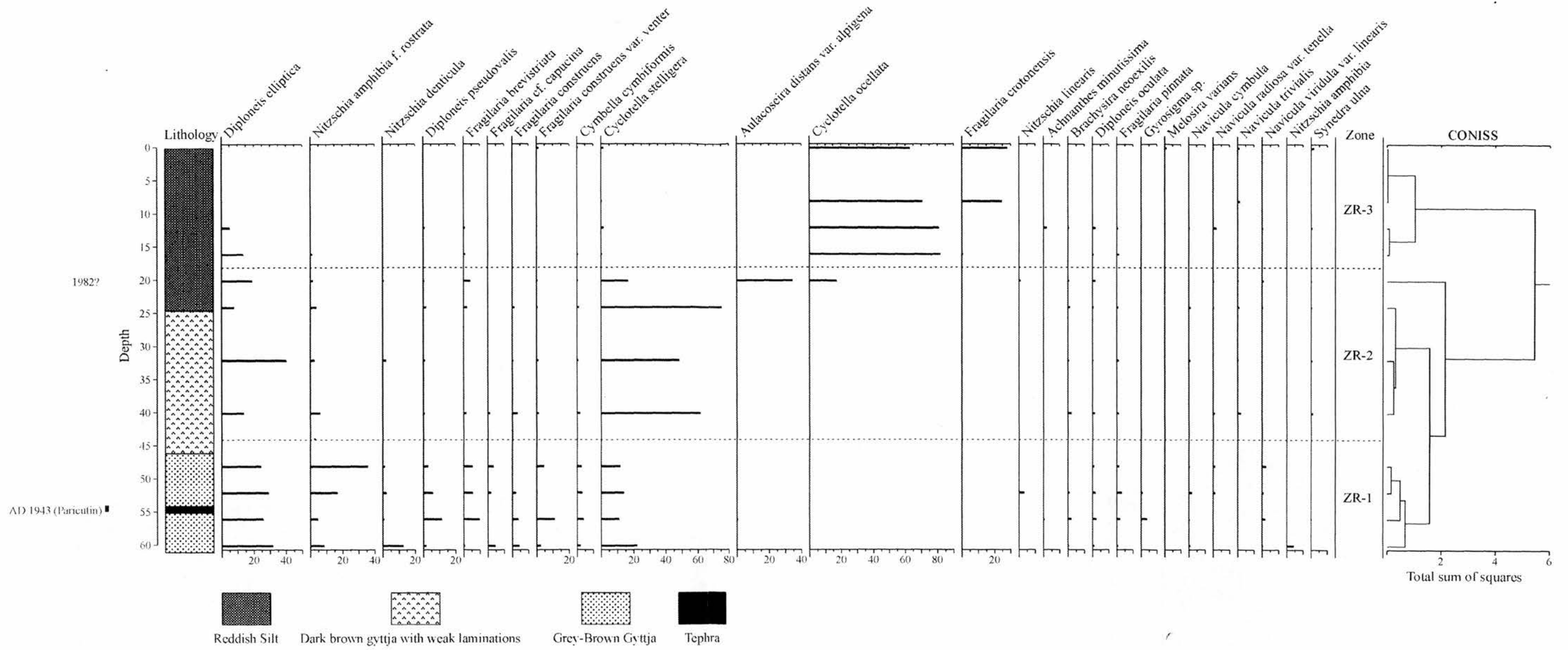


Figure 6.27: Diatom diagram for core ZR/98, Lago de Zirahuén

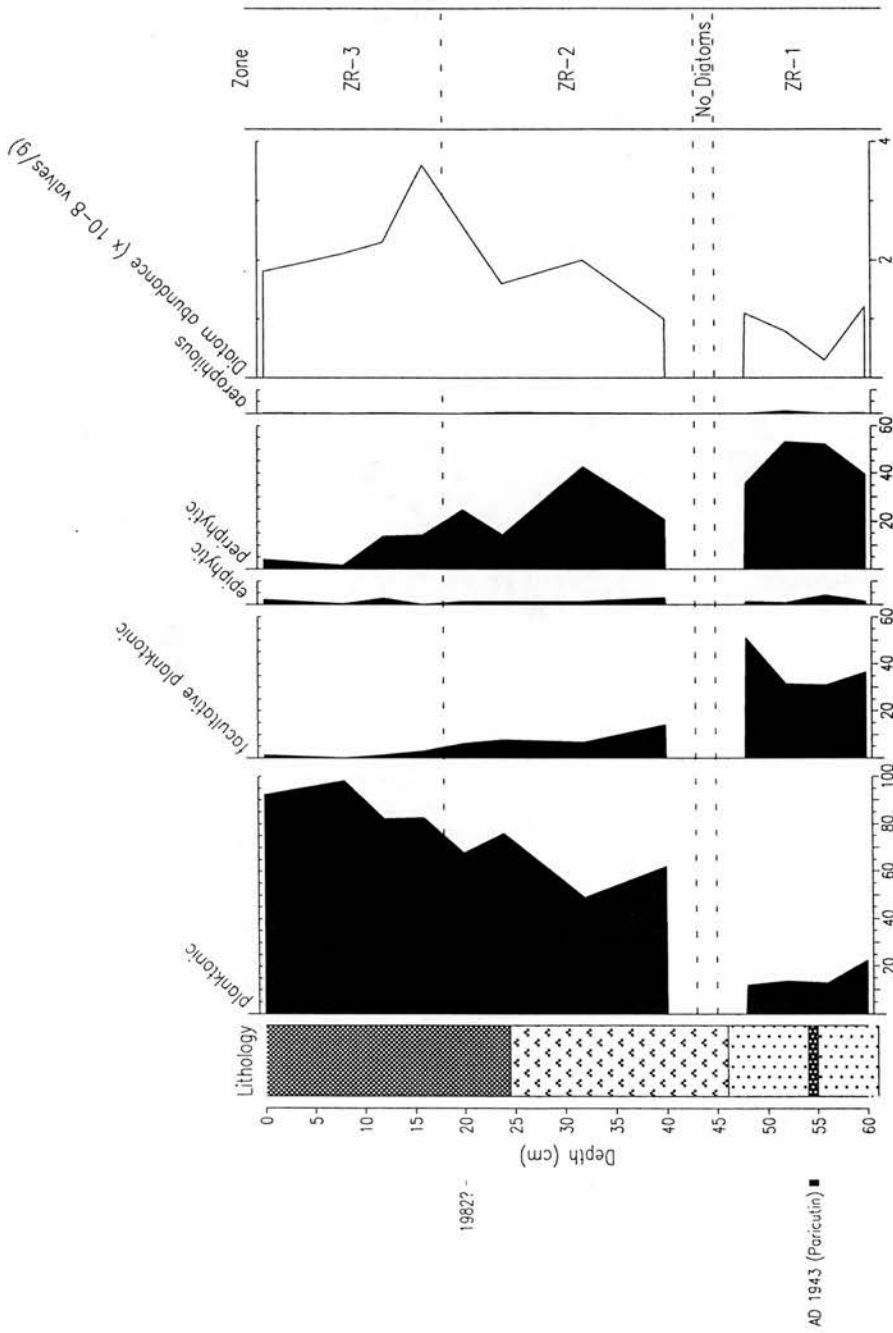
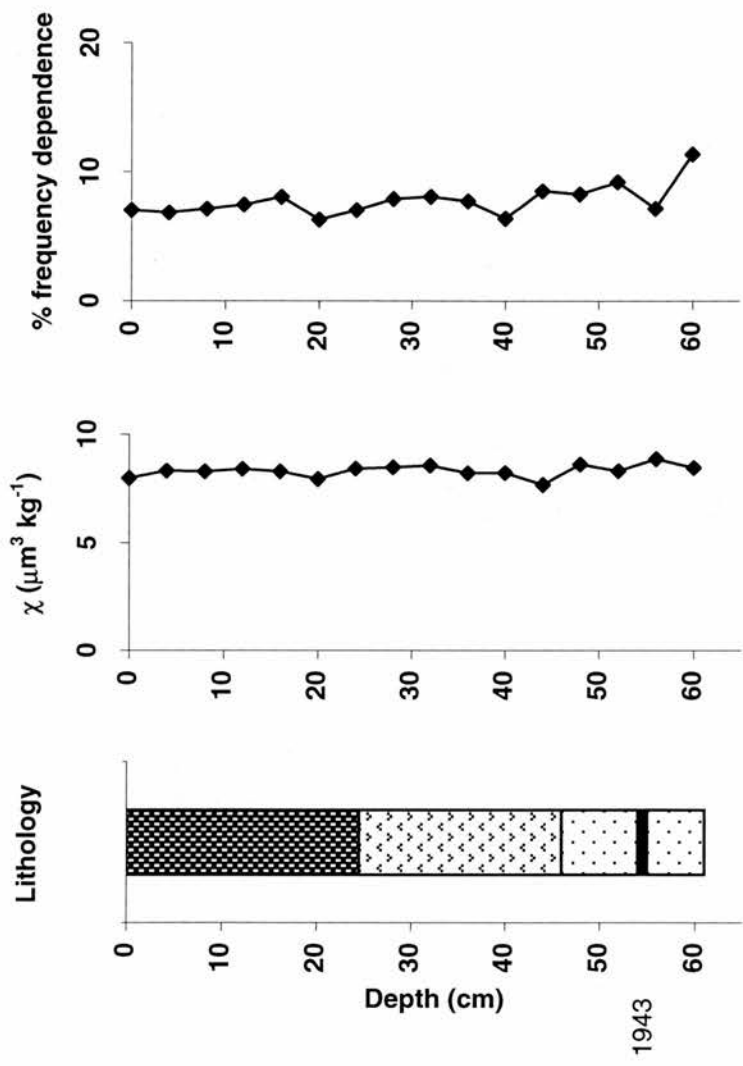


Figure 6.28: Diatom habitat groupings and diatom abundance, core ZR/98



**Figure 6.29:** Magnetic susceptibility, core ZR/98. Refer to Figure 6.27 for lithology key.

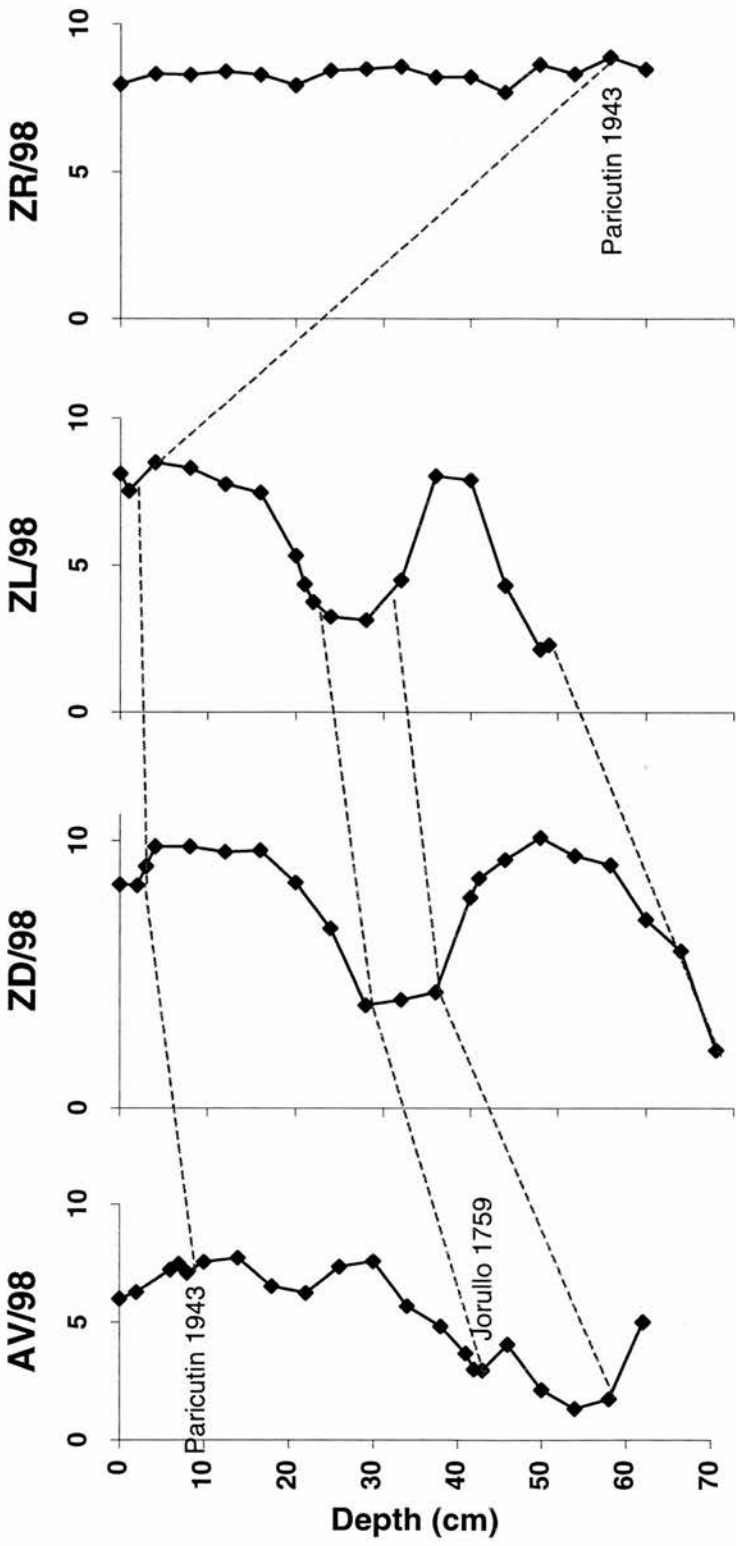
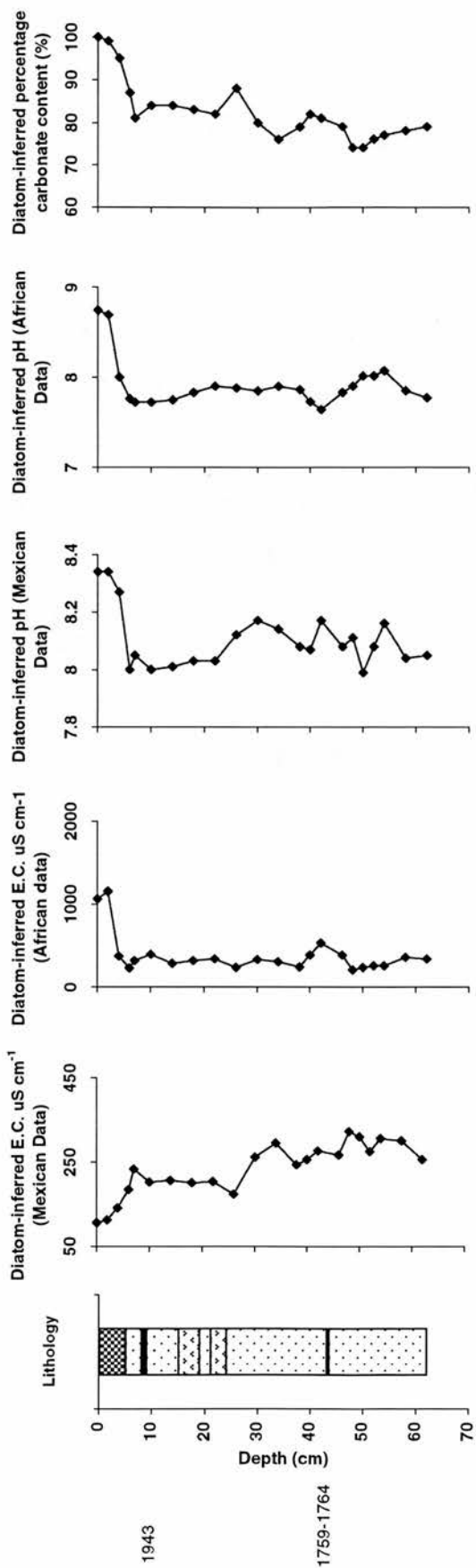
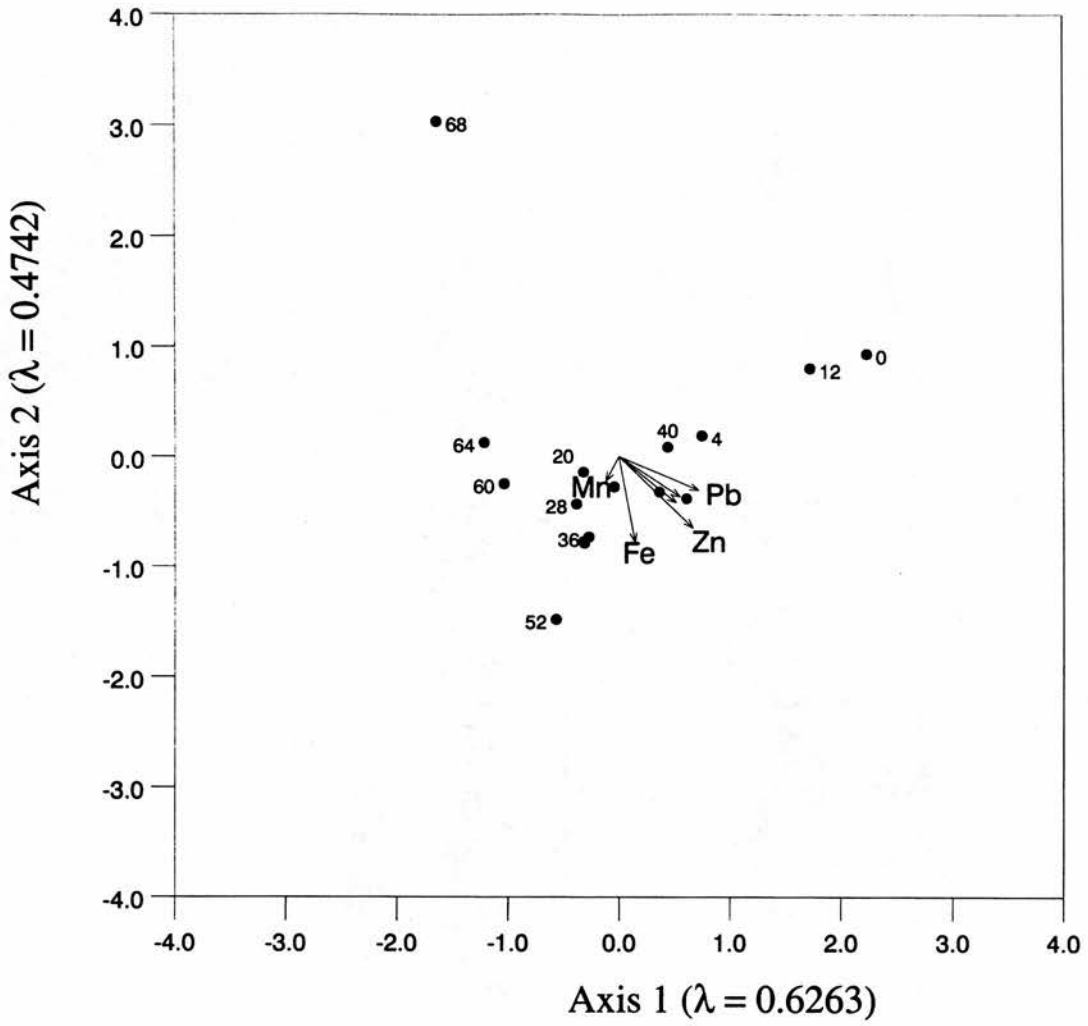



Figure 6.30: Correlation of magnetic susceptibility records between the four cores from Lago de Zirahuen.



**Figure 6.31:** Diatom-inferred reconstructions of E.C., pH and %CO<sub>3</sub> for core AV/98 using the Mexican dataset (Davies *et al.*, in press) and E. C. and pH using the African (Gasse *et al.*, 1995) datasets. Refer to Figure 6.15 for lithology key.



**Figure 6.32:** Biplot of samples and environmental variables along CCA axes 1 and 2 for core ZD/98.

Age (cal. AD)	Main Diatom Taxa	Sedimentary Evidence	Environmental Interpretation	Human Activity	Catchment Disturbance
Present-1982	<i>C. ocellata</i> <i>F. crotonensis</i>	Inputs of red, oxidised silt.	Cultural eutrophication. Soil erosion.	Increased tourism, intensive agriculture.	
1982 1850 1750	<i>C. stelligera</i> & <i>Fragilaria</i> spp. <i>E. naegelli</i> , <i>A. pellucida</i> , <i>Stenopterobia</i> spp.	High $\chi$ . High Cu & Pb levels. Increasing $\chi$ .	Increased inputs from the catchment. Heavy metal pollution. Lower lake level & increased influence of springs?	Large increase in population. Copper smelting at Santa Clara. Development of haciendas around the basin.	
1750  1550	<i>Fragilaria</i> spp.	Low $\chi$ .	Stable catchment. Planktonic diatoms out-competed?	Few settlements in basin, low population.	
1550	<i>Fragilaria</i> spp.	Decreasing $\chi$			
1100  1000	<i>A. ambigua</i> cf. var. <i>robusta</i> .  <i>A. granulata</i> var. <i>angustissima</i> . <i>Cyclostephanos</i> sp.	High $\chi$  Low $\chi$	Soil erosion.  Stable catchment, shallow, turbid lake, rich in nutrients. Drier climate?	No archival evidence for substantial pre-Hispanic population, but no archaeological work done in basin.	

**Figure 6.33:** Summary of environmental change in the Zirahuén Basin over the last ca. 1,000 years.

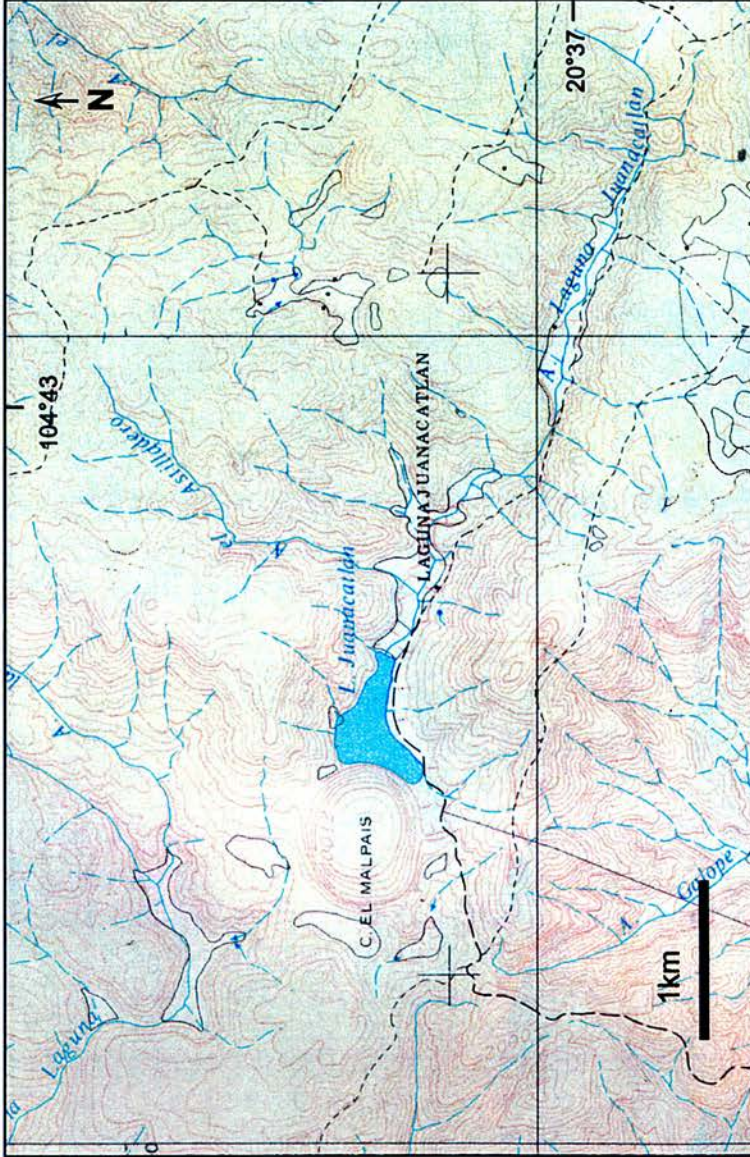


Figure 7.1: The Juanacatlán Basin (taken from Carta Topografica de Mascota: F-13-D-61, INEGI 1973).



a) Dry Season: February 1998.



b) Wet Season: September 1998.

**Figure 7.2:** Seasonal differences in vegetation at Laguna de Juanacatlan. This view is from the west end of the lake (Photographs: S. Metcalfe).



a) Dry Season: February 1998.

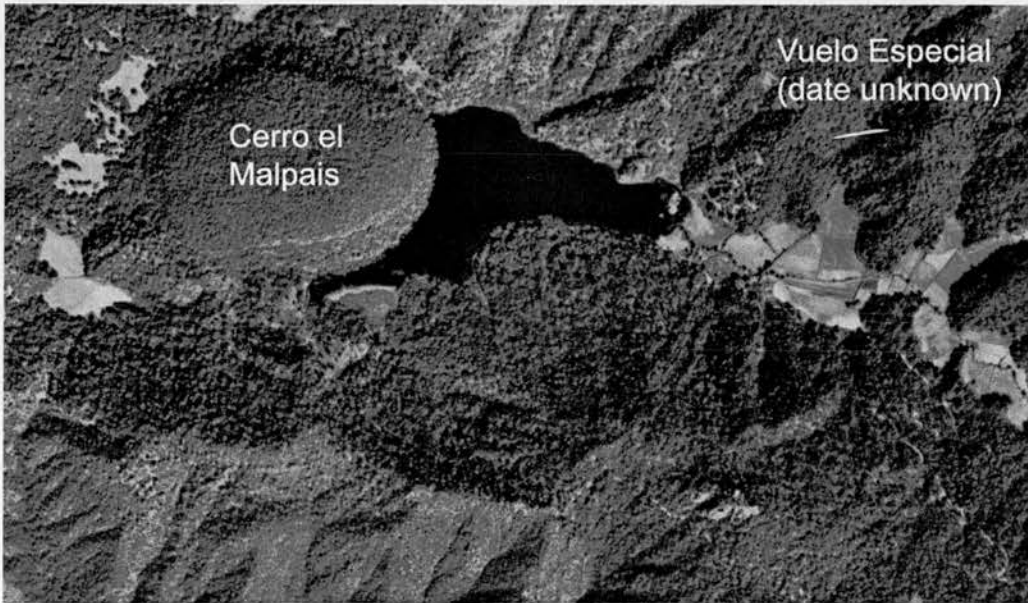
b) Wet Season: September 1998.



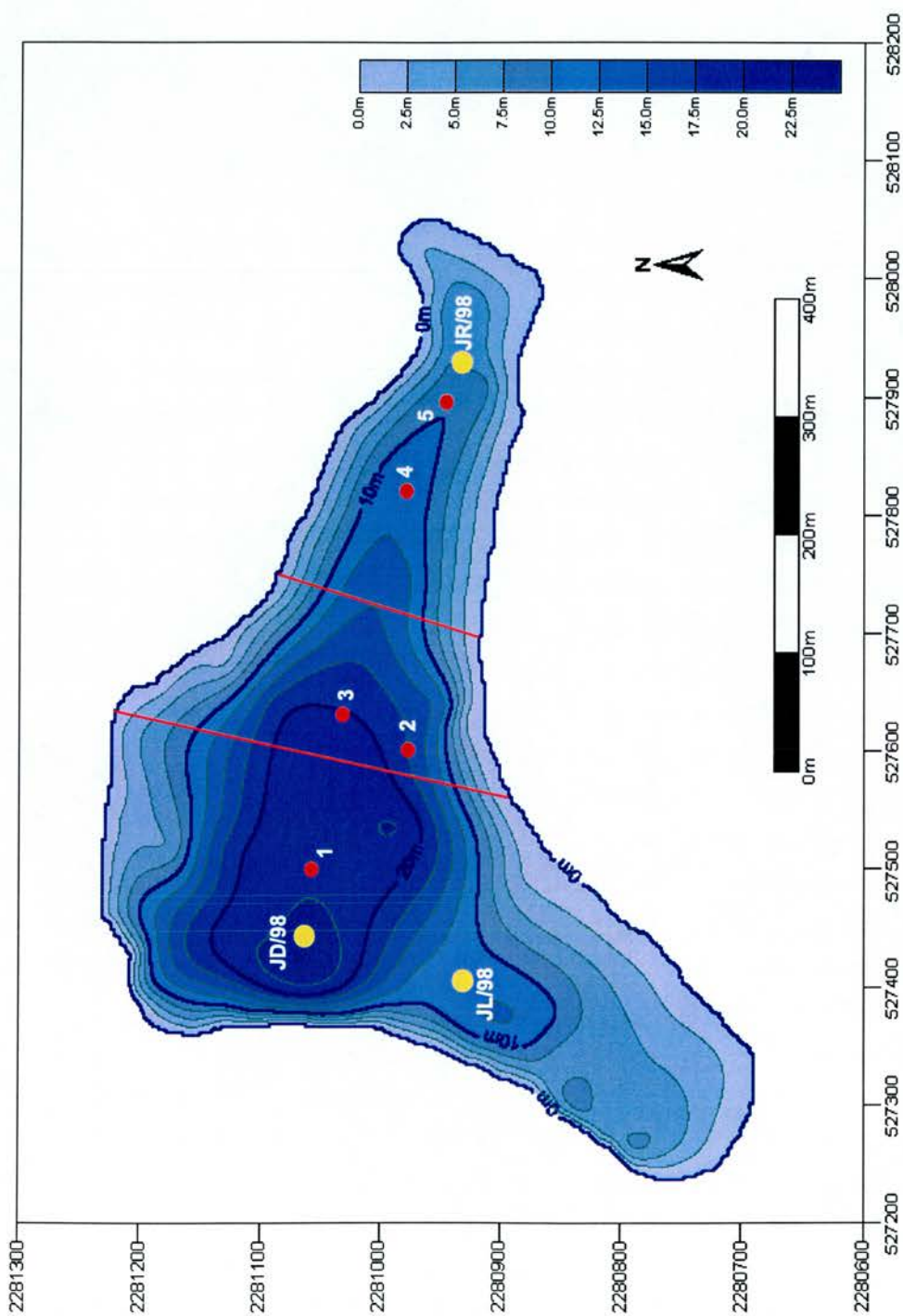
**Figure 7.3:** Seasonal differences in vegetation at Laguna de Juanacatlan. This view is taken from the eastern end, where the river flows into the lake (Photographs: S. Metcalfe).



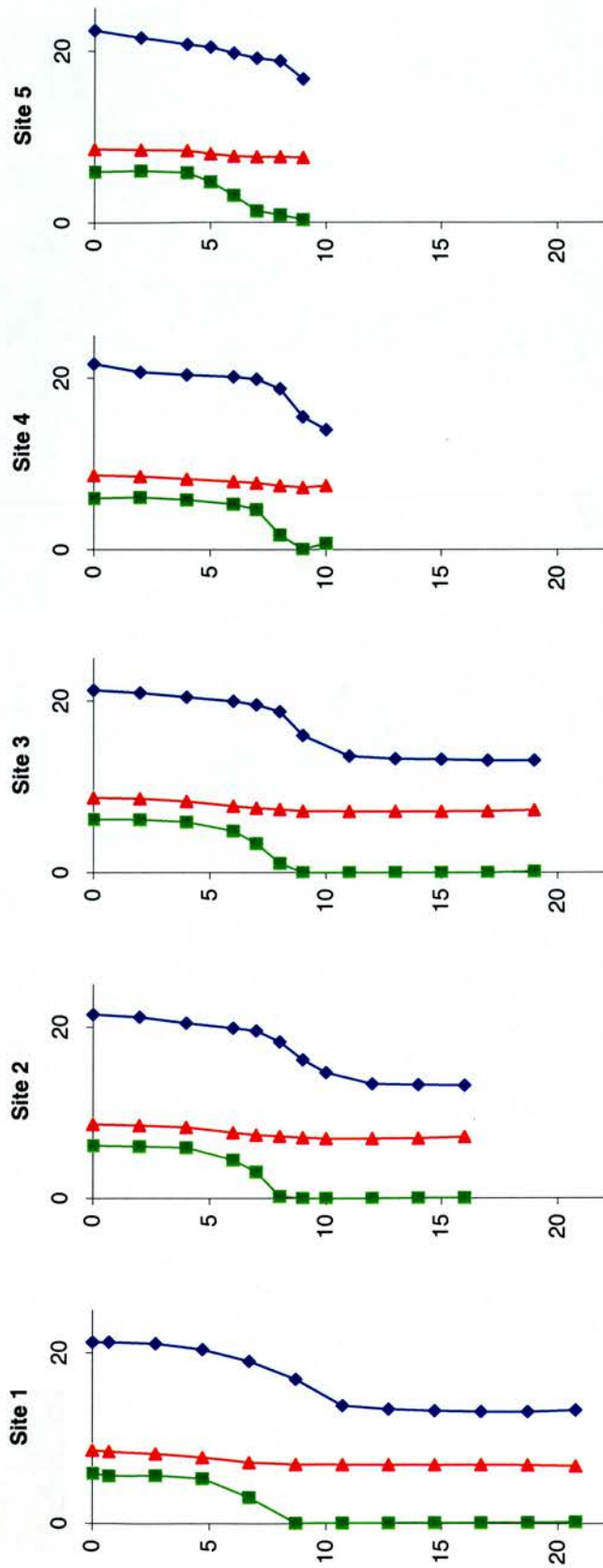
**Figure 7.4:** Dead willow trees above the present day shoreline at Laguna de Juanacatlan.



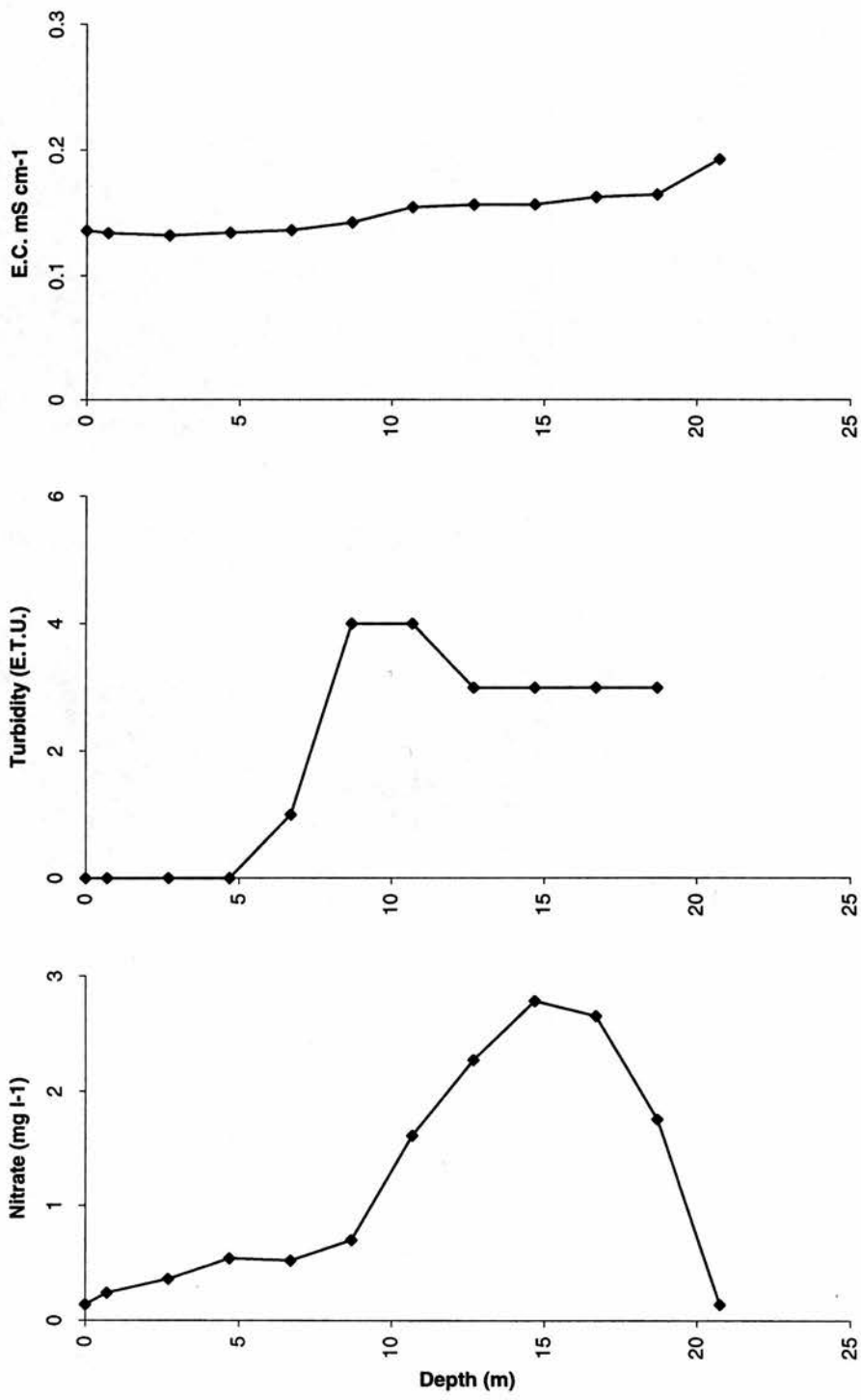
**Figure 7.5:** Comparison of aerial photographs illustrating lake level change at Laguna de Juanacatlan, Note how the area of the lake extends around the side of Cerro el Malpais in the bottom photograph.



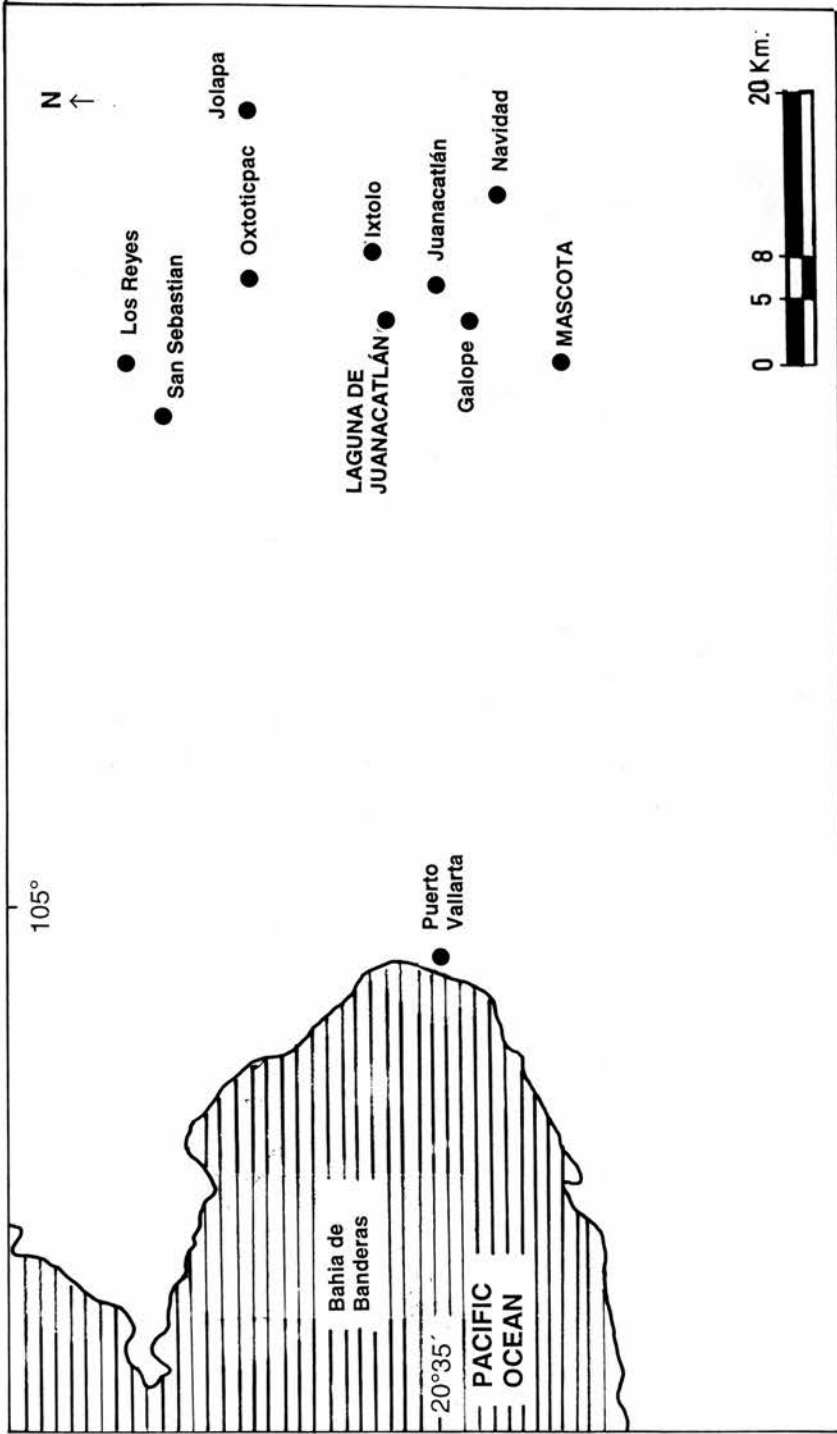
**Figure 7.6:** Preliminary bathymetry of Laguna de Juanacatlan. Bathymetric transects are shown as red lines, yellow circles represent coring sites and red circles represent sites of depth profiles of limnological measurements.



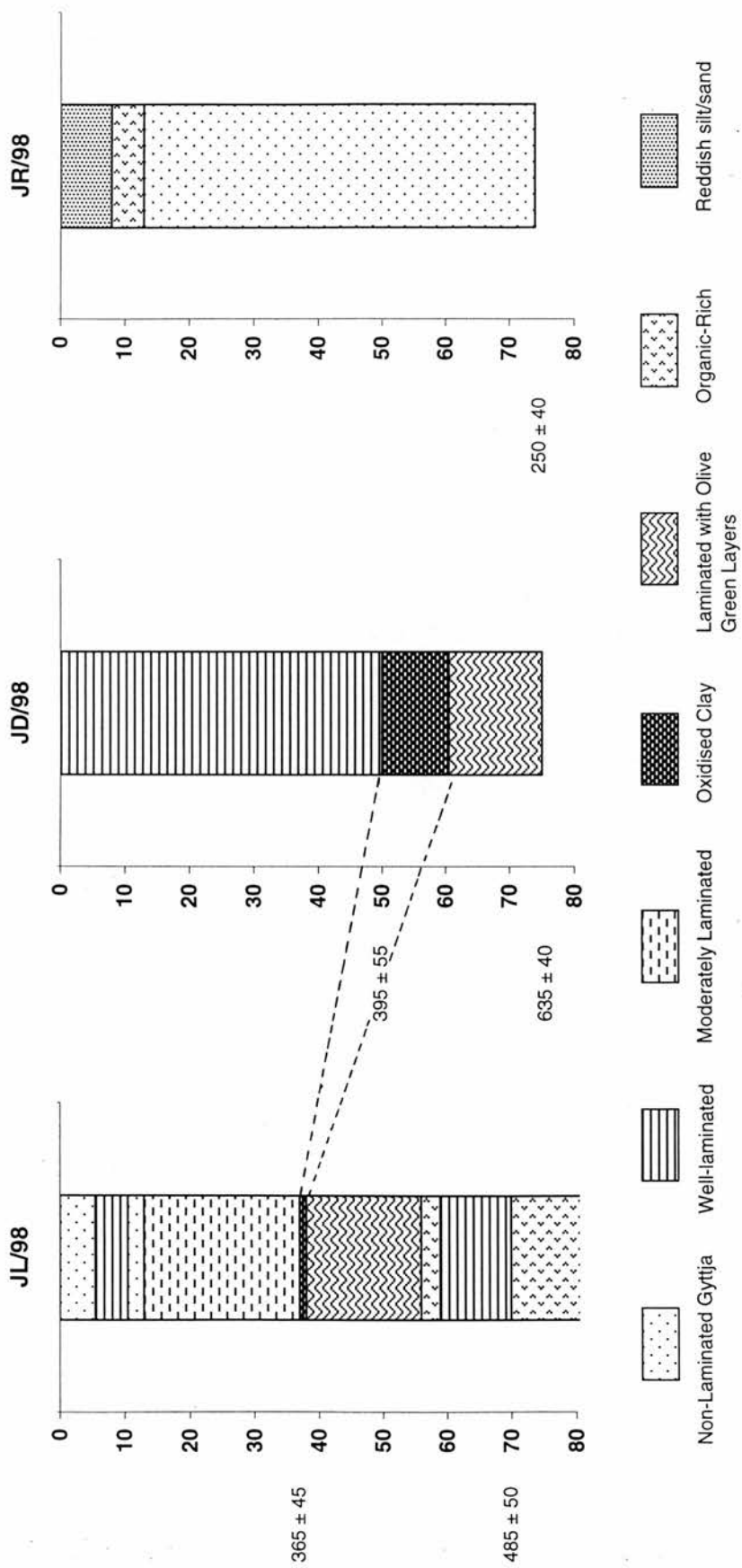
**Figure 7.7:** Depth profiles for sites 1-5. Temperature (°C) is shown in blue, pH is shown in red and DO (mg l<sup>-1</sup>) is shown in green.



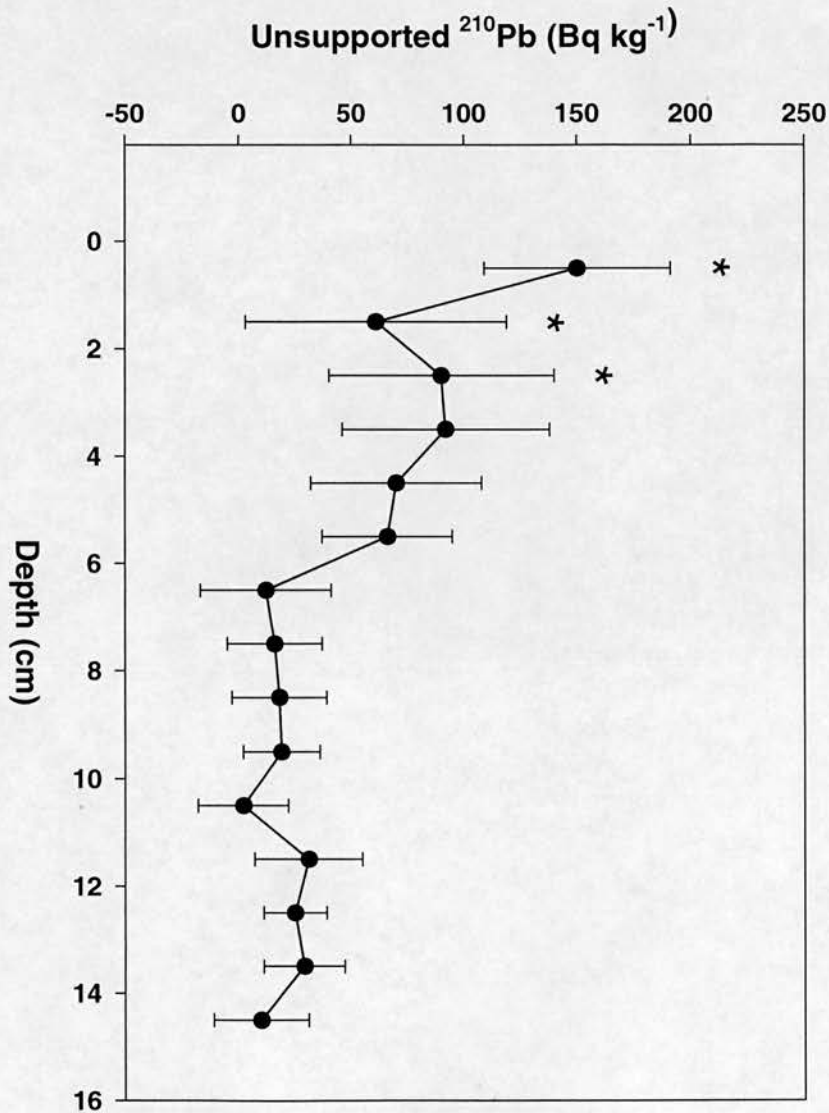
**Figure 7.8:** Nitrate, turbidity and E.C. profiles for Site 1, Laguna de Juanacatlan.



**Figure 7.9:** Location of towns and settlements around the Juanacatlán Basin referred to in the text.



**Figure 7.10:** Core stratigraphies from Laguna de Juanacatlán



**Figure 7.11:** Profile of unsupported  $^{210}\text{Pb}$  in core JL/98. Error bars are at the 1 sigma level. The asterisks indicate the presence of  $^{137}\text{Cs}$  at the detection limit in a bulk sample of the top 3 cm of the core.

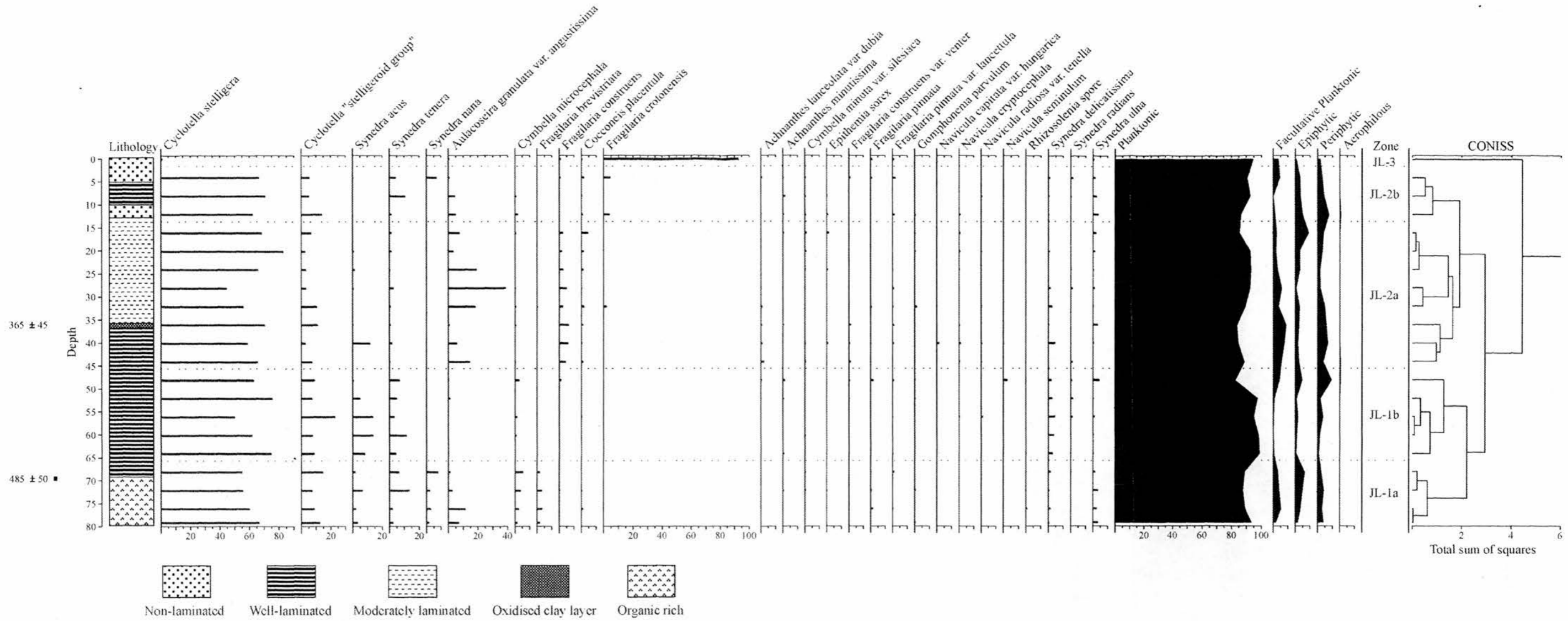
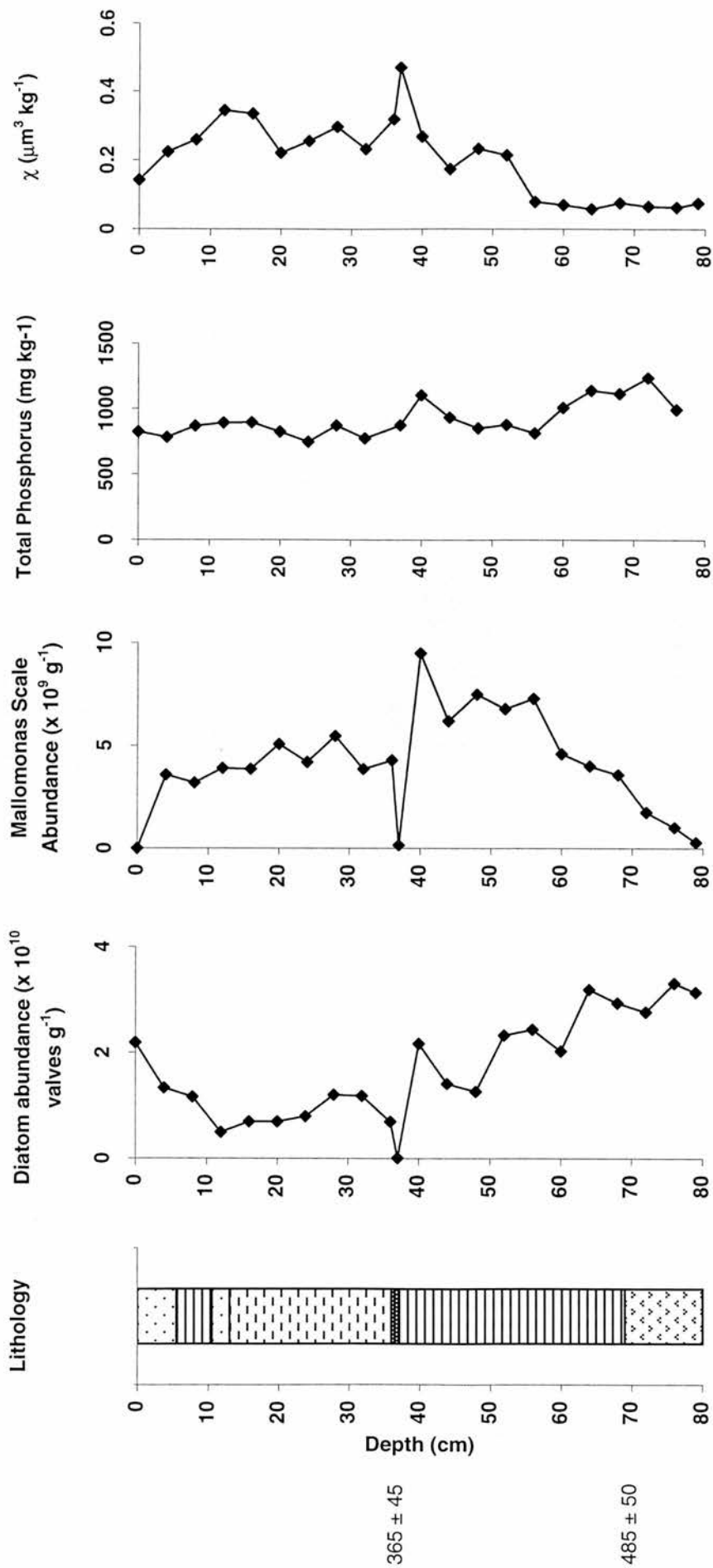


Figure 7.12: Diatom diagram for Core JL/98, Laguna de Juanacatlán



**Figure 7.13:** Diatom and *Mallomonas* Scale Abundance, Total Phosphorus and Magnetic Susceptibility, Core JL/98. Refer to Figure 7.12 for lithology key.

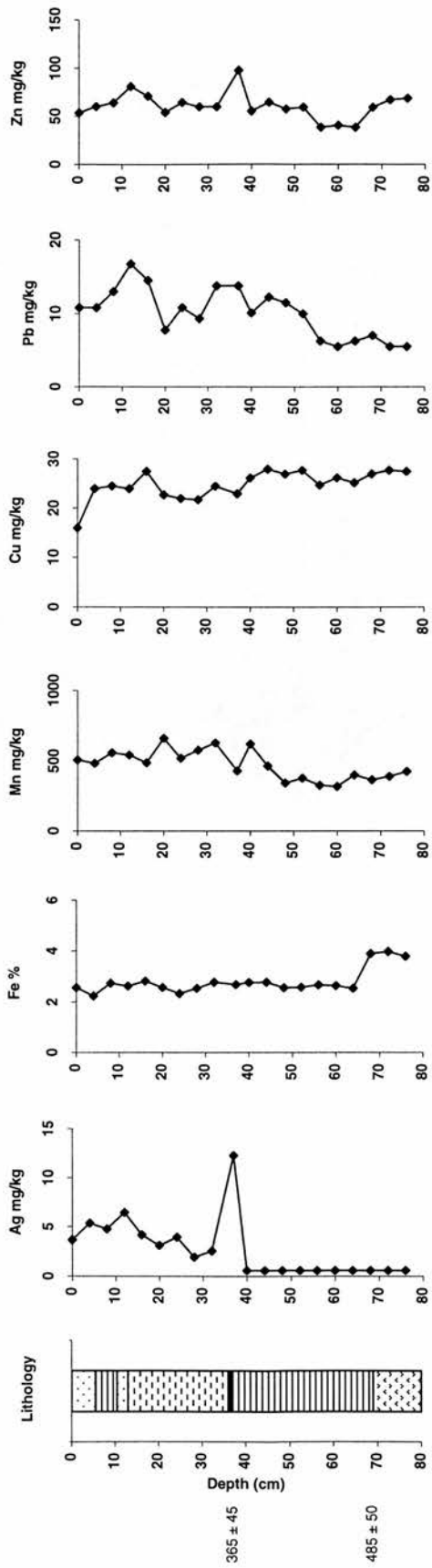


Figure 7.14: Results of metals analysis of core JL/98. Refer to Figure 7.12 for lithology key.

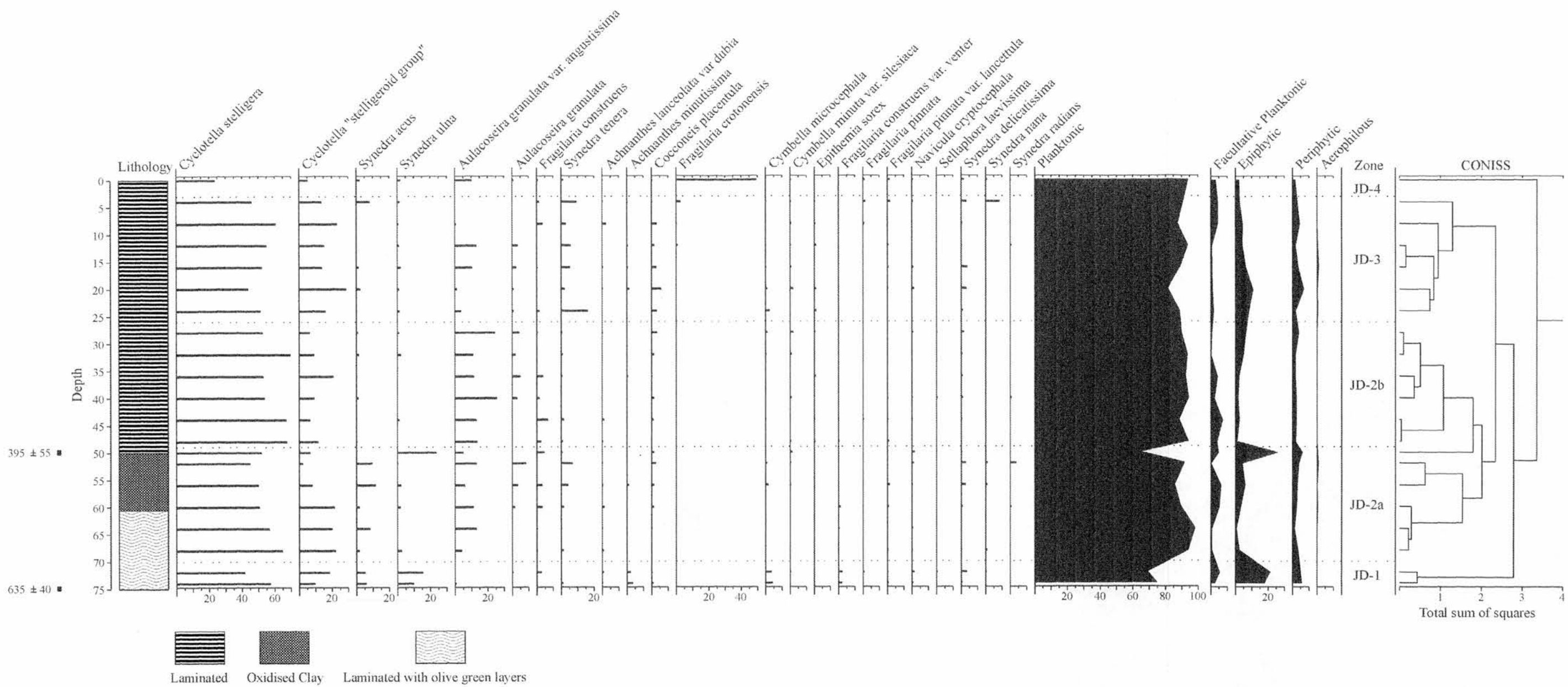
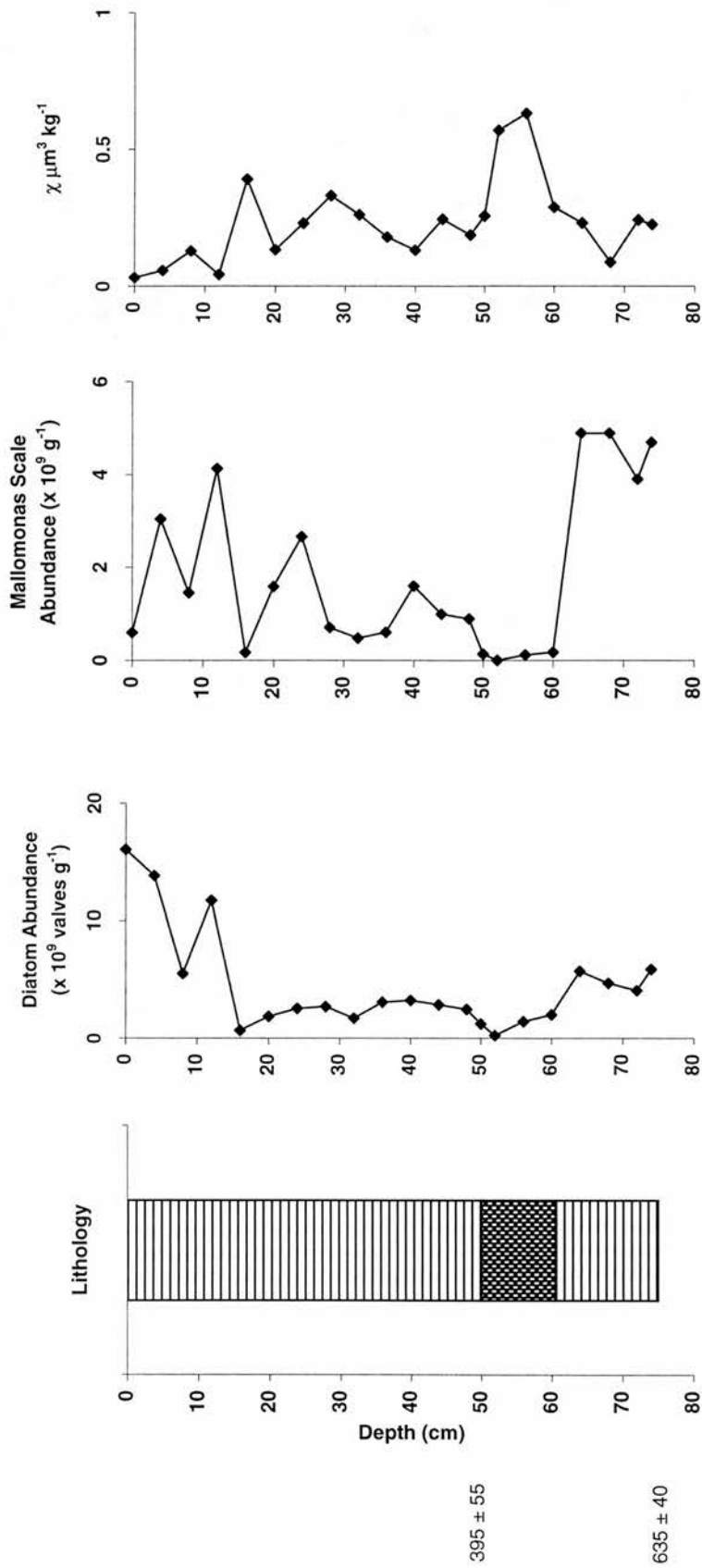


Figure 7.15: Diatom diagram for core JD/98, Laguna de Juanacatlán



**Figure 7.16:** Diatom and *Mallomonas* scale abundance and magnetic susceptibility, Core JD/98. Refer to Figure 7.15 for lithology key.

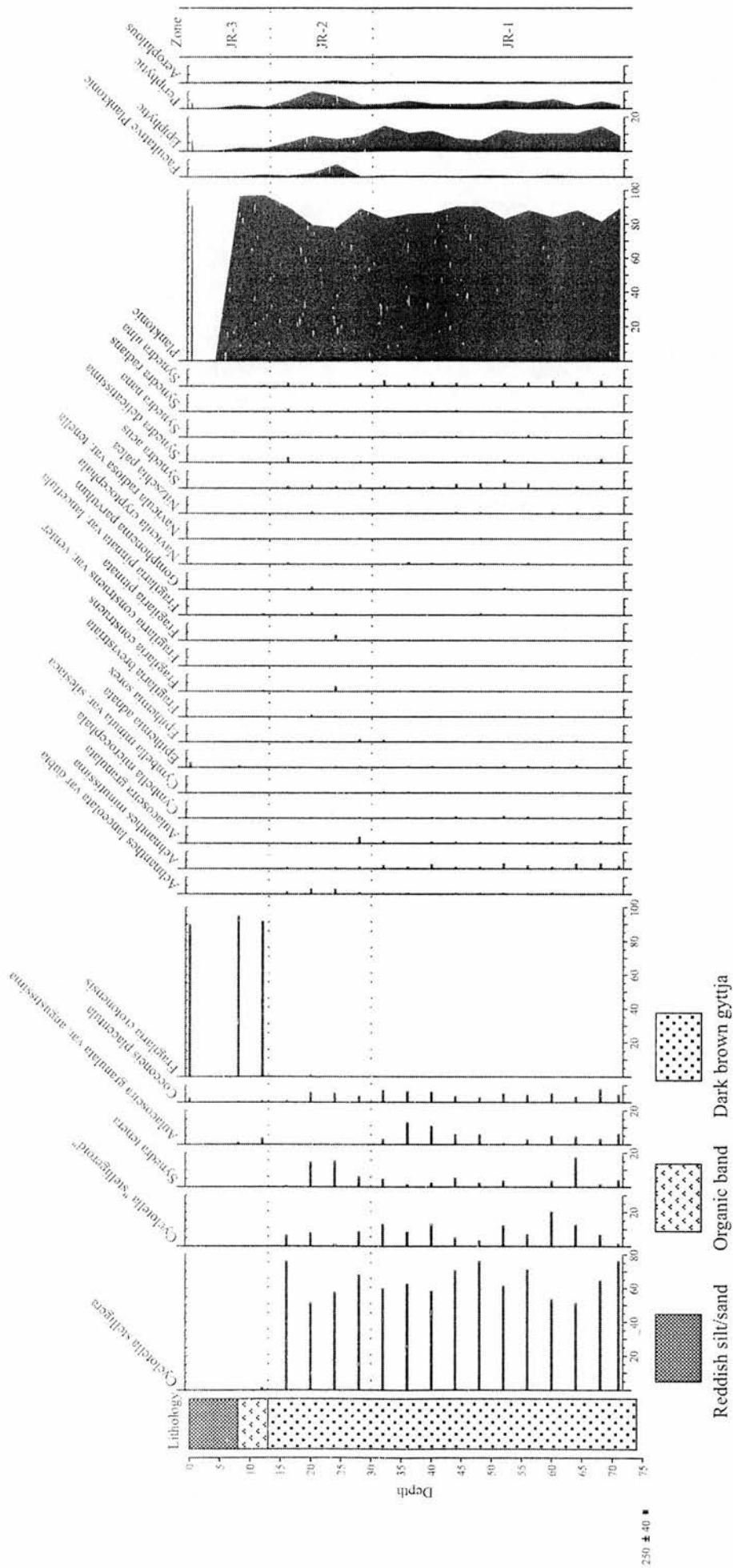
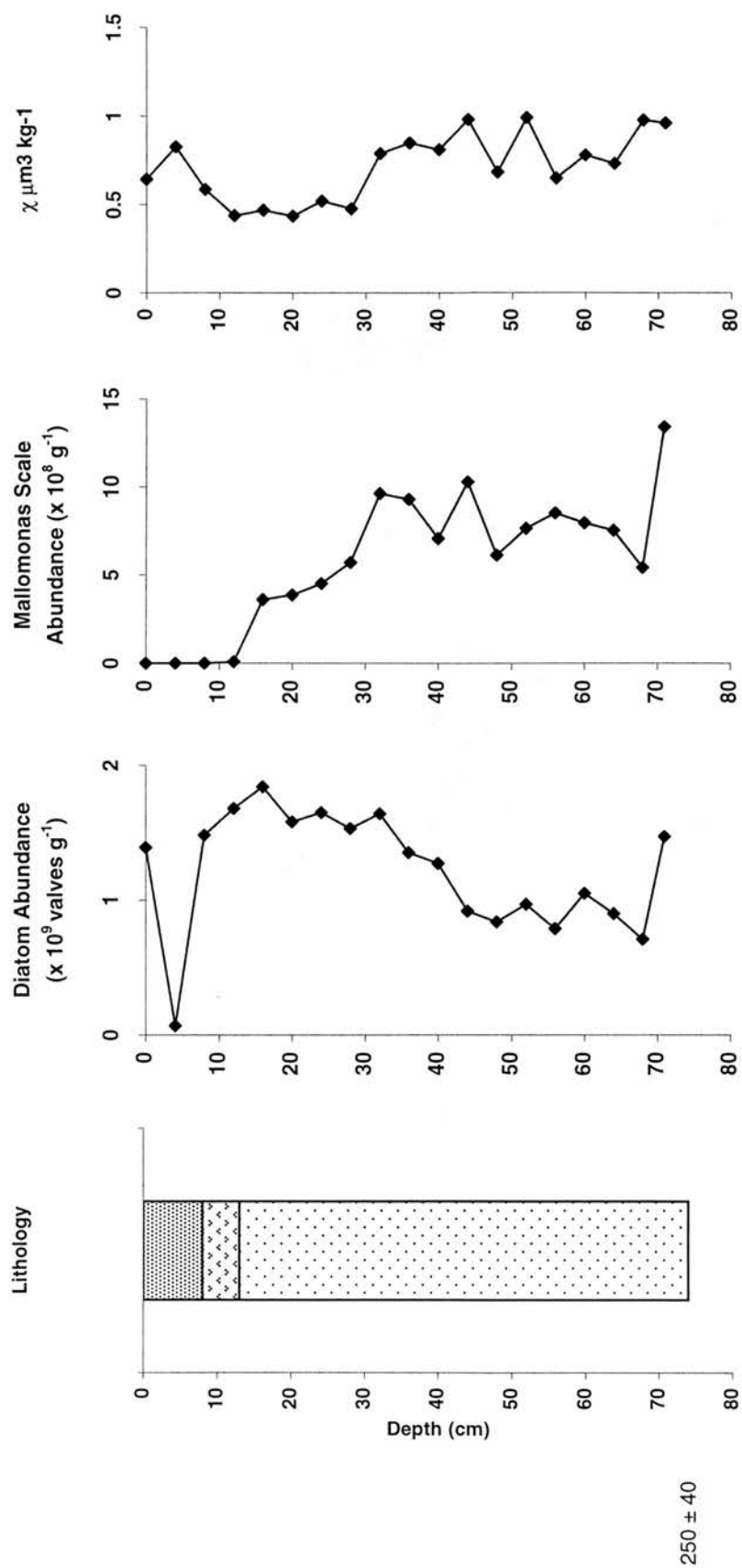
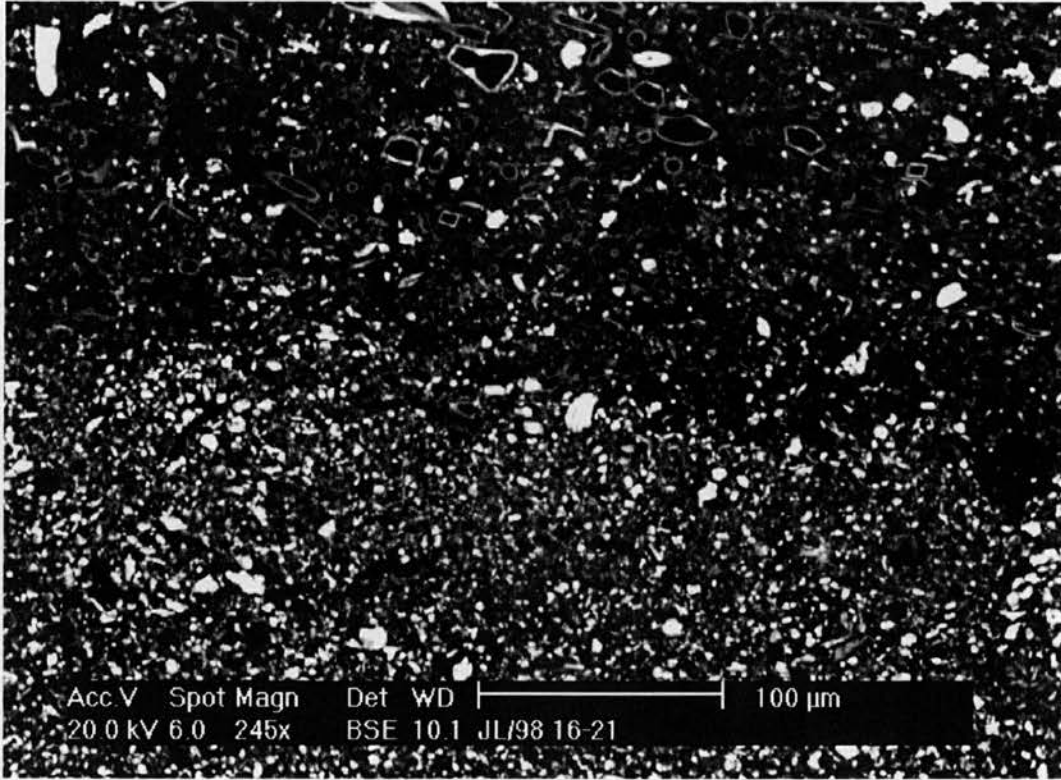


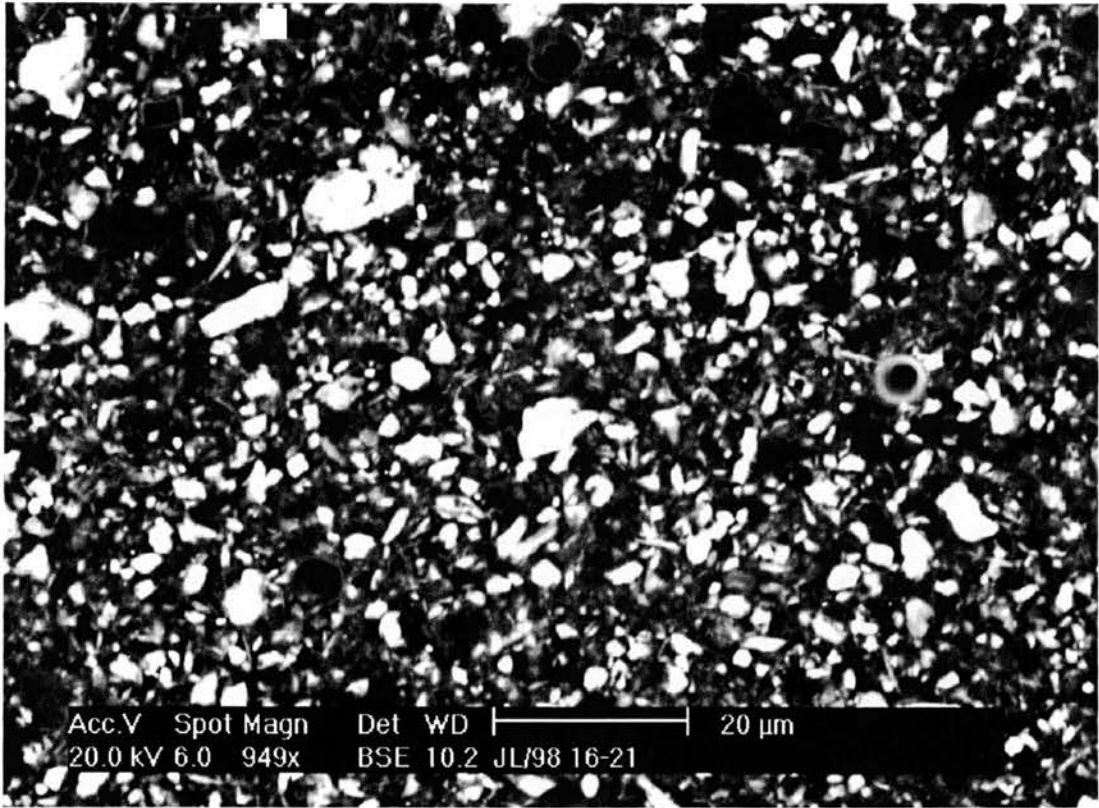
Figure 7.17: Diatom diagram for core JR/98, Laguna de Juanacatlan.



**Figure 7.18:** Diatom and *Mallomonas* Scale Abundance and Magnetic Susceptibility for core JR/98 Refer to Figure 7.17 for lithology key.



**Figure 7.19:** BSE image illustrating the difference between the different types of laminated sediment. The top half of the image represents a dark, organic band of sediment, rich in diatoms. The bottom half is a pale pink clay layer, containing relatively few diatoms.



a) Clay Layer

b) Organic Layer

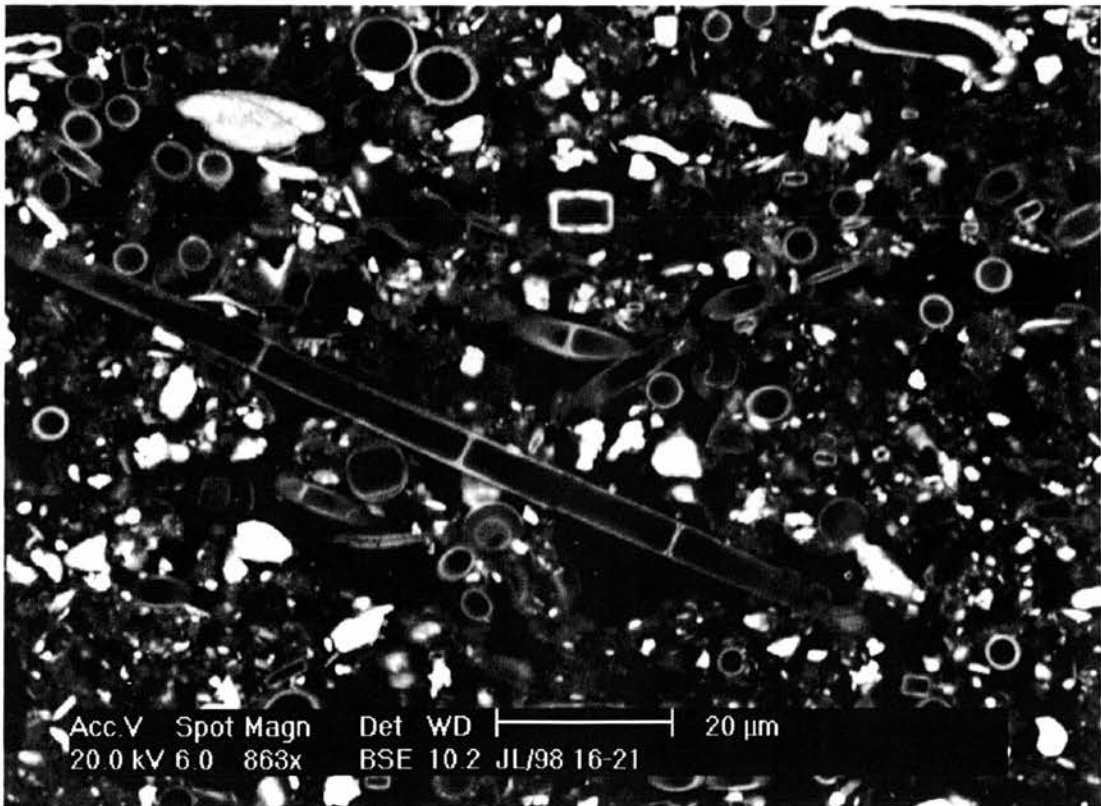
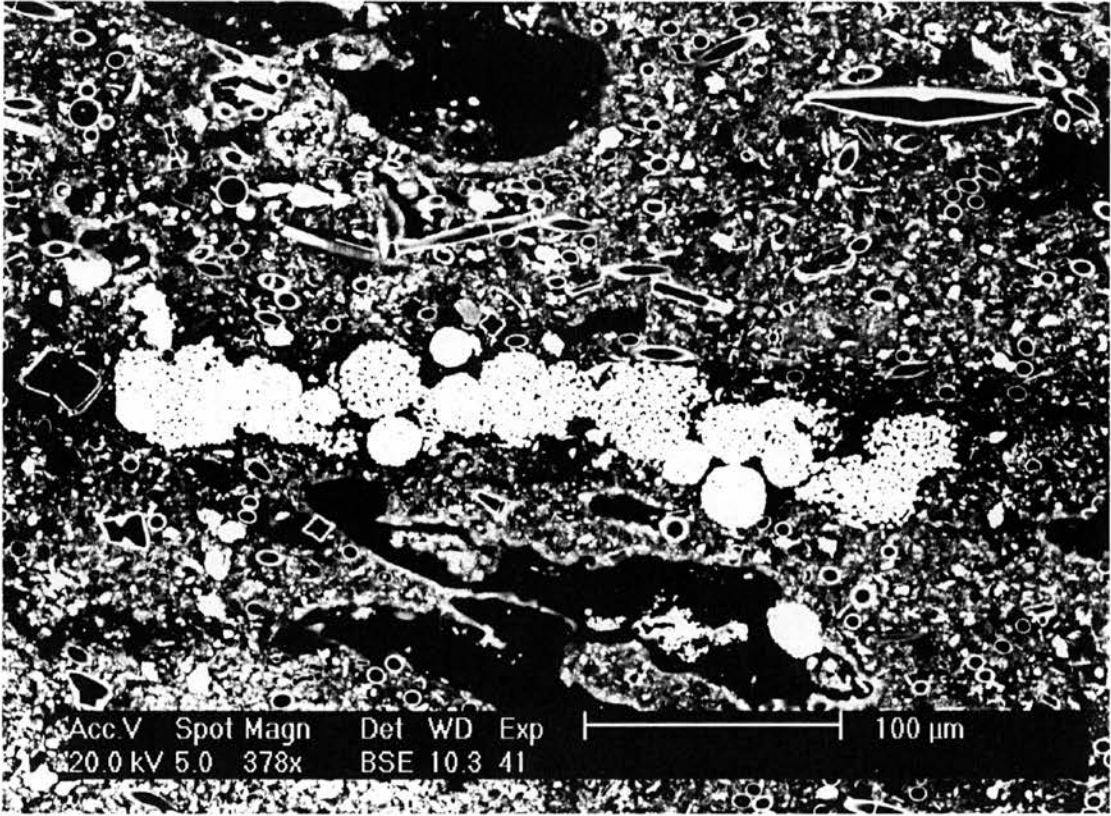
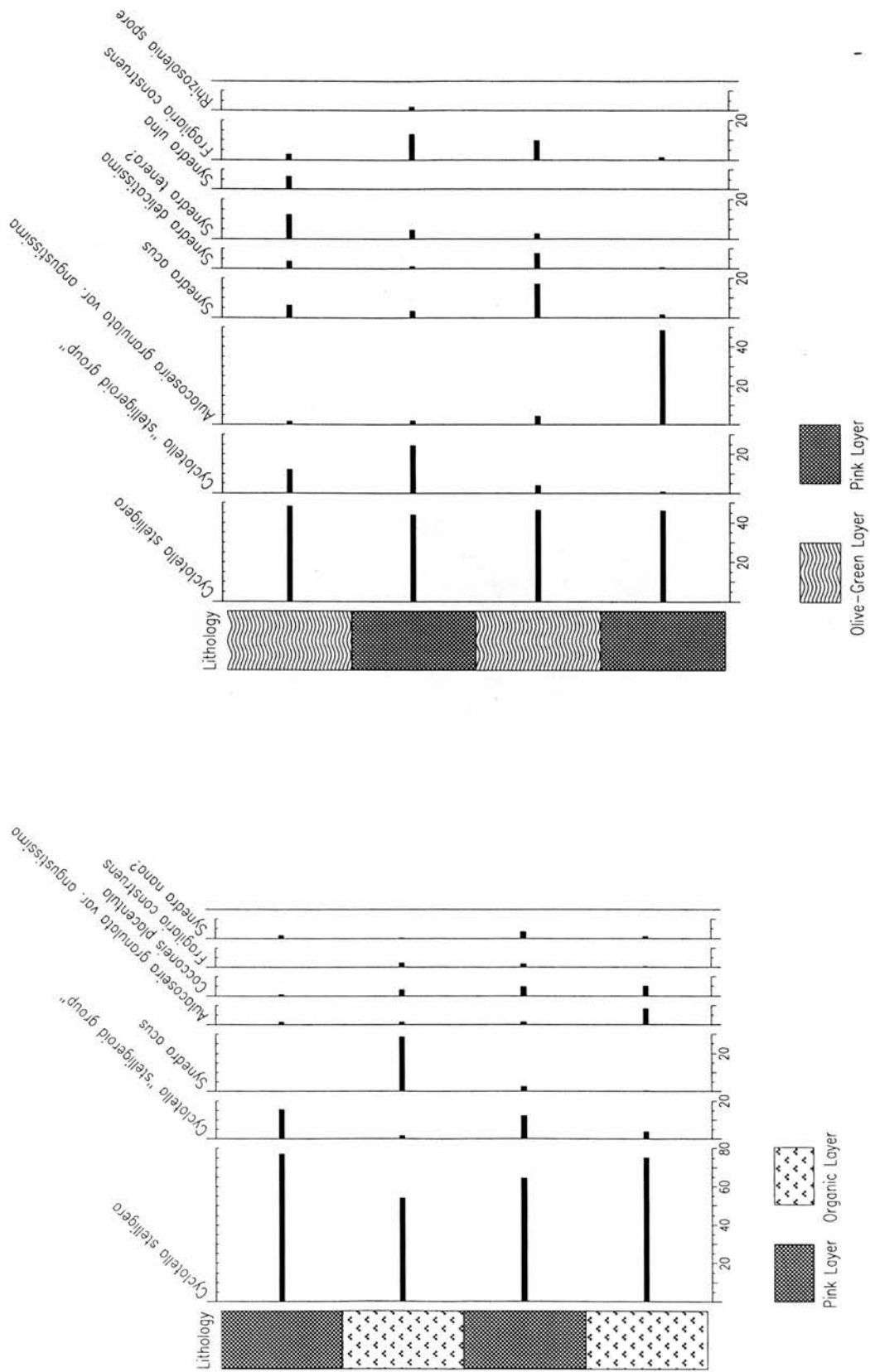


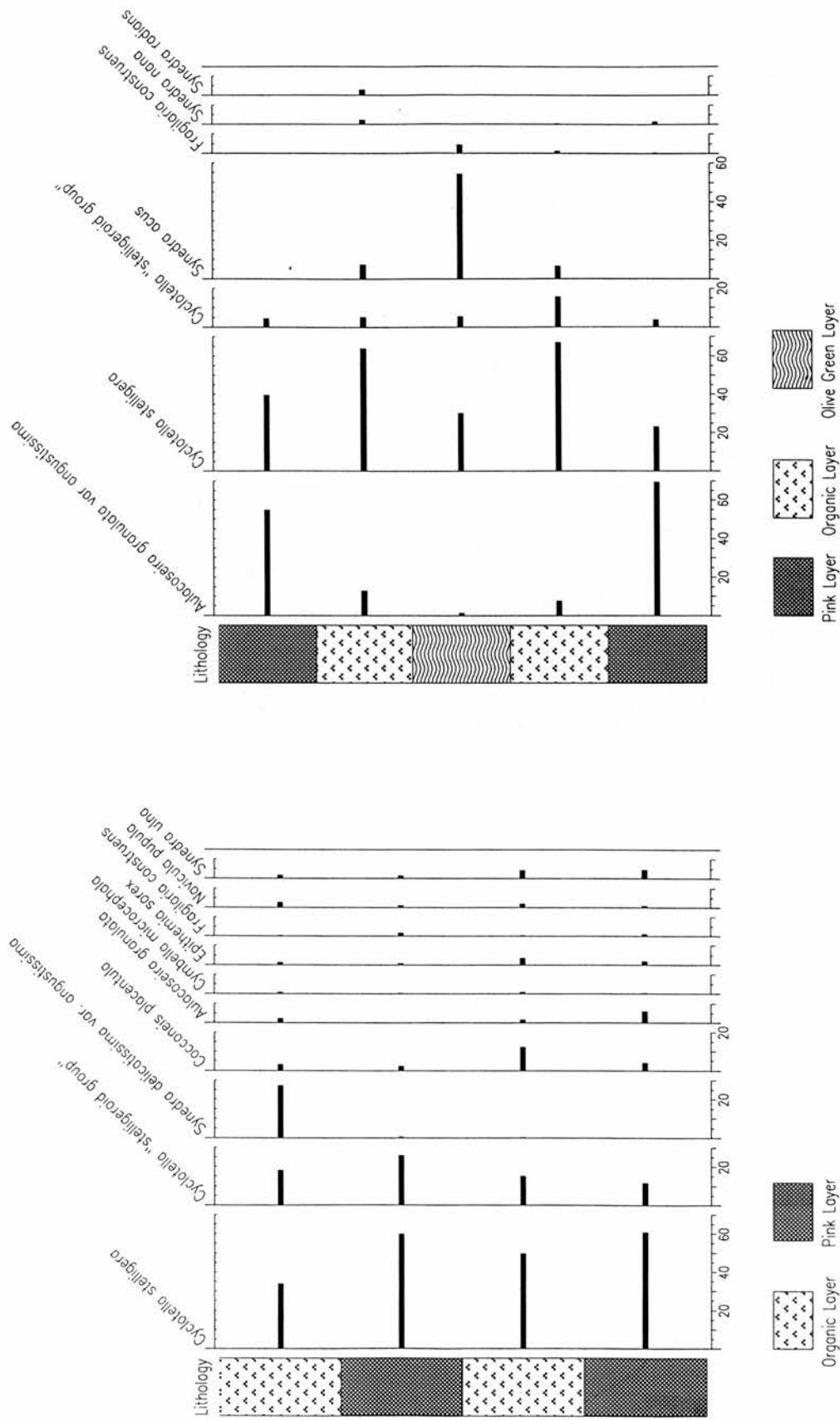
Figure 7.20: BSE images showing the detail of laminae composition for a) clay layers and b) organic layers.



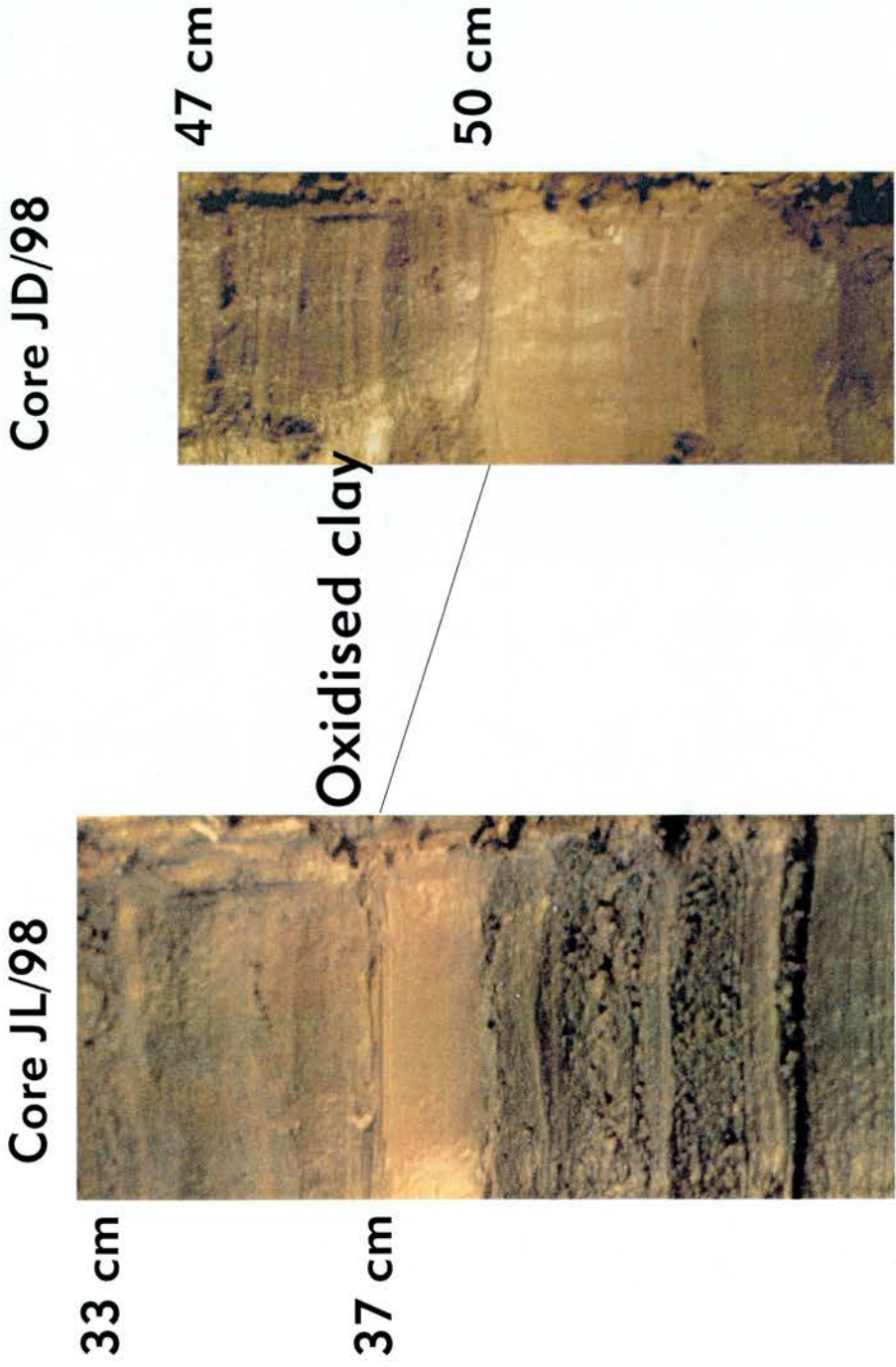
**Figure 7.21:** BSE image illustrating the sulphide spherules found in organic layers of sediment.



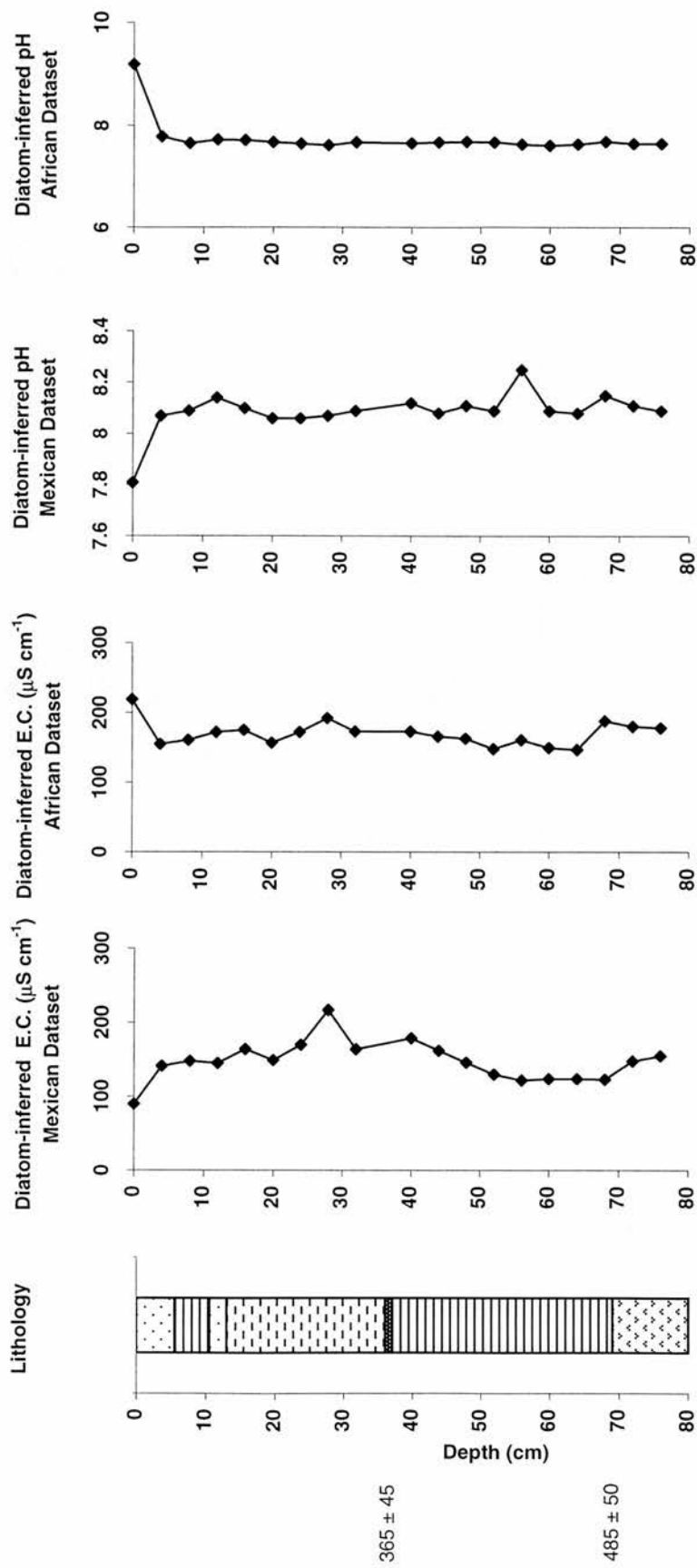
**Figure 7.22:** Diatom assemblages in laminated sections from core JL/98: **a)** 9-9.5 cm and **b)** 39.5-40.5 cm.



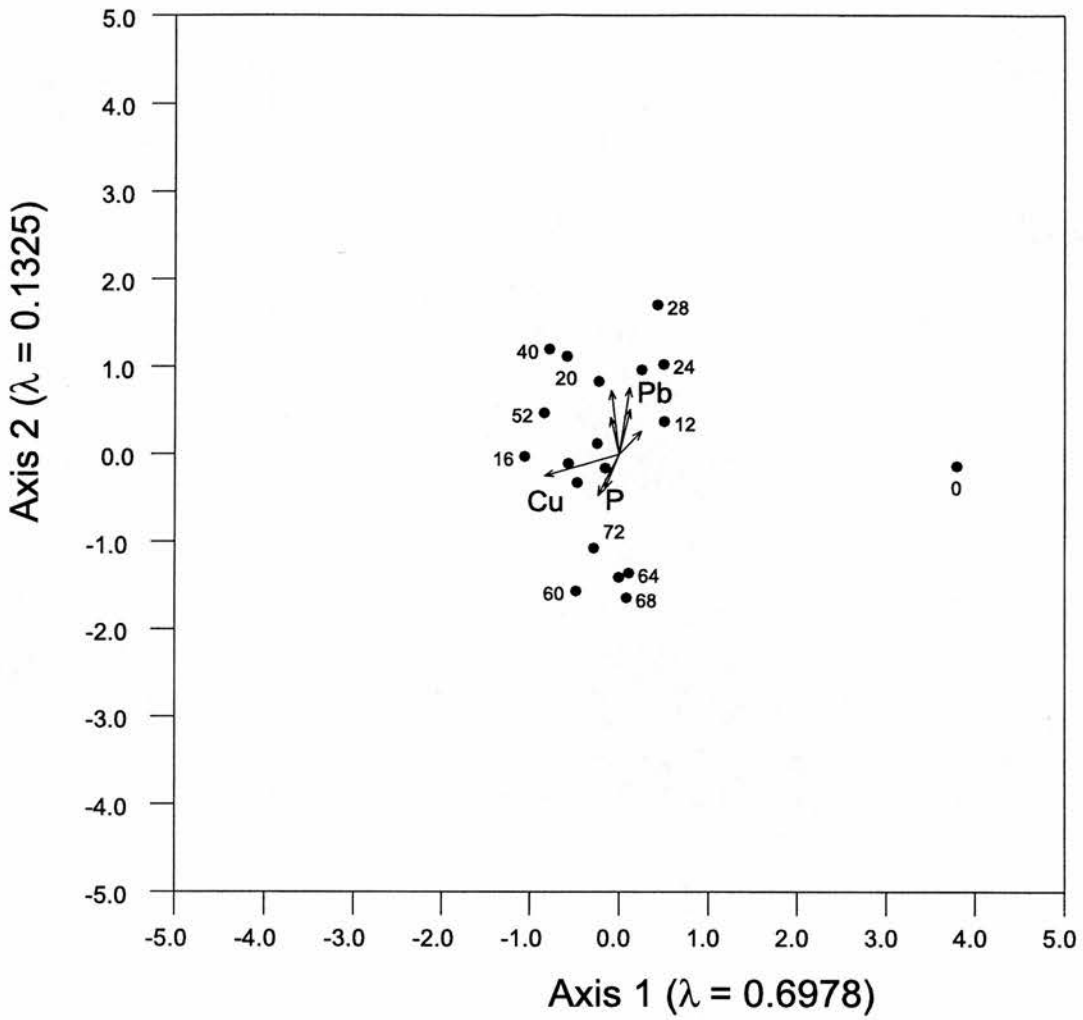
**Figure 7.23:** Diatom assemblages in laminated sections from core JD/98: **a)** 20.5-21 cm and **b)** 63-63.9 cm.



**Figure 7.24:** Correlation between cores JL/98 and JD/98 using the oxidised clay layer.



**Figure 7.25:** Quantitative reconstructions of E.C. and pH using the Mexican dataset (Davies *et al.*, in press) and the African dataset (Gasse *et al.*, 1995).



**Figure 7.26:** Biplot of samples and environmental variables for core JL/98 on CCA axes 1 and 2.

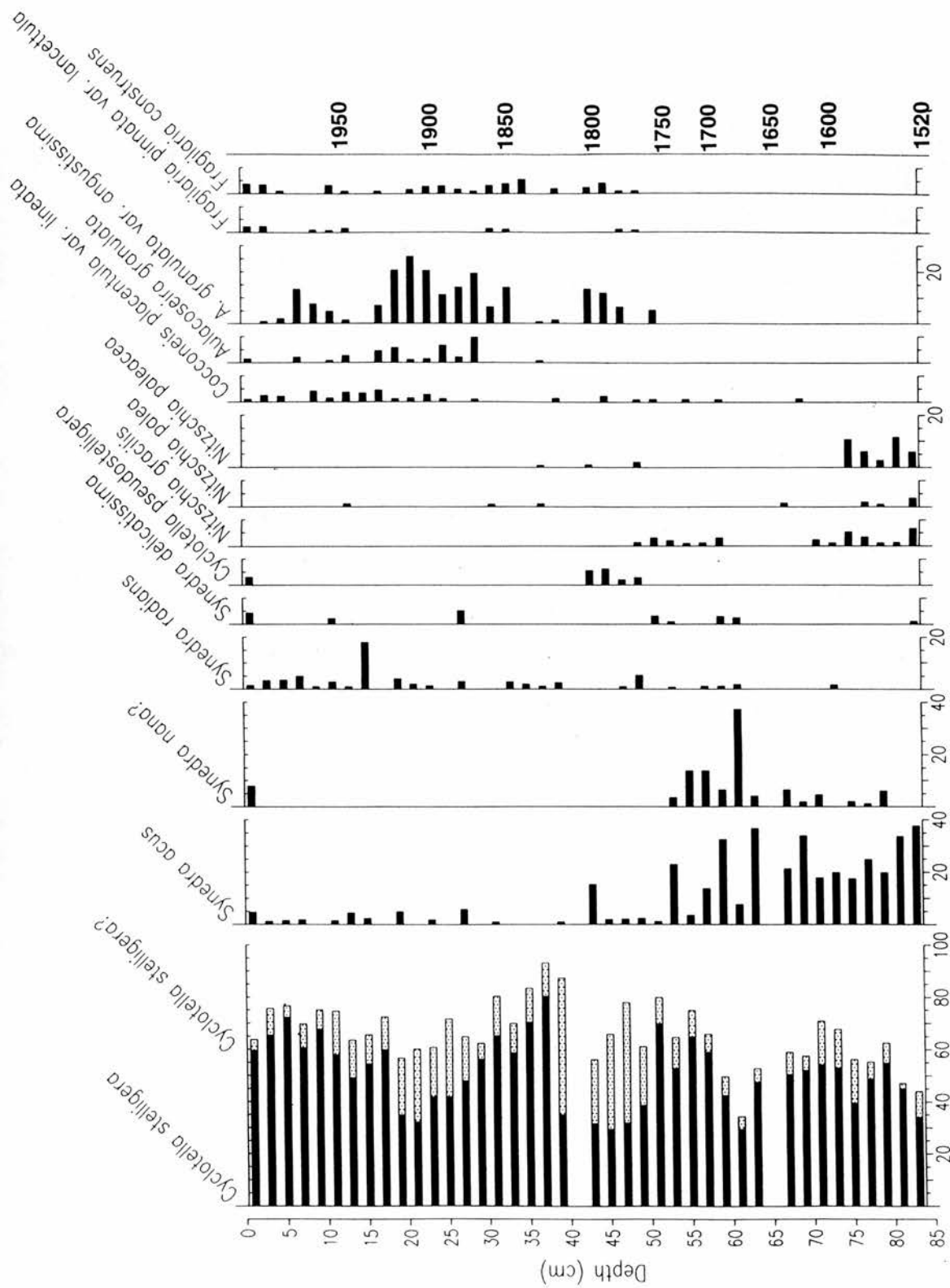
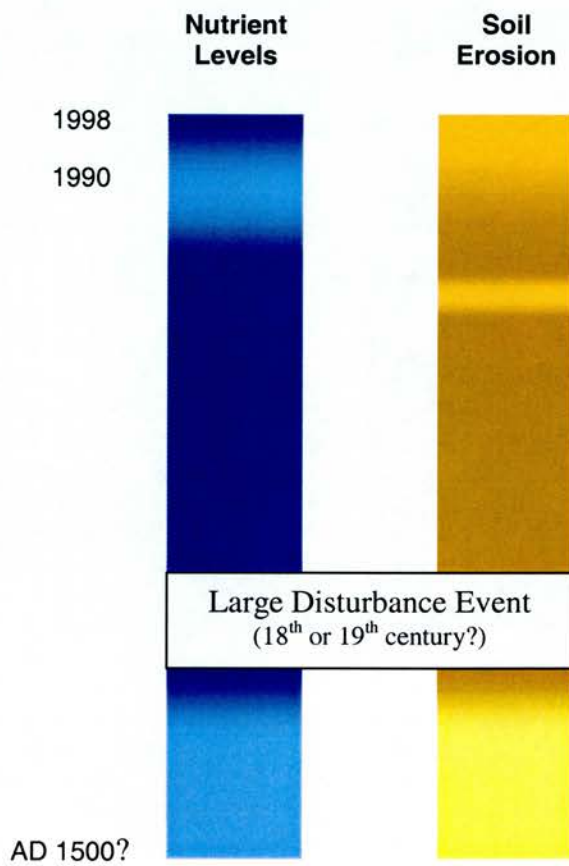


Figure 7.27: Diatom diagram for the 1990 core from Laguna de Juanacatlán (Metcalfe, unpubl. data).



**Figure 7.28:** Summary of environmental change at Laguna de Juanacatlán over the last ca. 500 years based on diatom, magnetic susceptibility and metal concentrations.

<b>Years BC/AD</b>	<b>Western Mesoamerica: Major Cultural Periods</b>	<b>Central Mexico: General Cultural Sequence</b>	<b>Years BP</b>
1500	Late (PURÉPECHA)	Tenochtitlán (AZTEC)	450
1250	<b>POSTCLASSIC</b>		700
1000	Early	Tula (TOLTEC)	950
750	Epiclassic		1200
500	Classic		1450
250		Teotihuacán	1700
AD	Final		1950
BC			
250	Late Pre-Classic (CHUPICUARO)	Cuicuilco	2200
500			2450
750	<b>PRECLASSIC</b>	Development of regional capitals	2700
1000	Middle Pre-Classic El Opeño		2950
1250			3200
1500		Towns	3450
1750			3700
2000	Early Pre-Classic		3950
2250		Development of an agrarian economy	4200
2500			4450

**Table 3.1:** The chronology of prehistory in central Mexico (modified from Endfield, 1997).

Name	Type	Latitude	Longitude	Altitude	Date	Max. Depth (m)	pH	E.C. (uS/cm)	Secchi Depth (m)	Alkalinity (ppm)	Hardness (ppm)	Nitrate (ppm)	Phosphate (ppm)	Chloride (ppm)	Silica (ppm)
<b>Guanajuato</b>															
Hoya la Alberca	crater lake	20 23	101 12	1780	01/04/97	> 8	-	*6000	0.5	>800	400	undetectable	0.17	504	3.68
Lago de Yuriria	modified lake	20 15	101 10	1730	31/03/97	>1	8.69	*1900	-	816	278	undetectable	>3.05	180	16.12
La Piscina de Yuriria	crater lake	20 13	101 08	1730	31/03/97	0.5	10.18	*7800	0	4260	interference	undetectable	2.9	1040	>40.3
<b>Jalisco</b>															
Arroyo del Atajo	stream	20 37	104 51	1280	24/03/97	n/a	7.53	89	-	72	52	undetectable	0.26	24	>4.03
Arroyo el Puerto	stream	20 35	104 43	1960	26/03/97	n/a	8	86	-	60	36	0.308	0.05	24	>8.06
Lago de Atotonilco	playa lake	20 34	103 70	1600	29/03/97	0.5	9.69	unreliable	0	>1600	interference	0.88	>3.05	1304	>16.12
Lago de Cajitlan	large lake	20 42	103 35	1570	29/03/97	>2	8.65	unreliable	0.2	392	136	undetectable	1.41	56	>16.12
Lago de Chapala	large lake	20 15	103 50	1523	30/03/97	6	8.59	unreliable	0.1	376	200	0.35	5.72	92	>8.06
Laguna de Juanacatlan	lava-dammed lake	20 37	104 44	1995	25/03/97	25	8.78	147.1	1.8	80	48	undetectable	0	24	1.88
					26/02/98		8.09	140	-	-	-	-	-	-	-
La Yerbabuena	artificial pond	20 32	104 45	1300	11/09/98		8.65	136	-	-	-	-	-	-	-
Laguna Potrerillo	pool	20 34	104 51	1250	28/03/97	0.5	7.73	92.4	-	-	-	-	-	-	-
					27/03/97	1	7.45	83.3	-	76	42	undetectable	2.69	28	>8.06
<b>Michoacan</b>															
Lago de Cutzeo	large lake	20 04	101 19	1820	31/03/97	0.5	9.02	*3,200	0.1	1900	76	undetectable	3	400	>16.12
Lago de Patzcuaro	large lake	19 35	101 39	2035	02/04/97	12	-	*870	0.1	608	160	undetectable	0.1	92	8.44
Lago de Zirahuen	lava-dammed lake	19 25	101 46	2075	02/04/97	40	8.4	*112	2	52	36	undetectable	0.03	32	0.16
Lagunilla de San Gregorio	lava-dammed lake	19 25	101 30	3100	15/09/98	1	6.57	26	-	16	13	undetectable	-	0.1	1.6
Rio de la Palma	river	19 26	101 43	2075	02/04/97	0.5	-	-	-	-	-	-	-	-	-
<b>Oriental Basin</b>															
Laguna Alichichica	crater lake	19 24	97 24	2345	08/04/97	64	9.31	-	4	4520	2340	-	0.05	5520	0.75
Laguna Preciosa	crater lake	19 21	97 22	2365	08/04/97	45	8.9	-	1.2	1600	1120	-	0	820	>16.12
Laguna Quechulac	crater lake	19 21	97 21	2395	08/04/97	40	8.82	-	6.2	800	400	-	2.78	480	2.43

Table 5.1: Modern diatom sampling sites; location and field water chemistry data.

Name	Diatom		Sample vegetation	Type algae	stone scraping	Date Sampled	Total Samples
	surface sediment	plankton					
<b>Guanajuato</b>							
Hoya la Alberca	X	X				01/04/97	2
Lago de Yuriria	X		X			31/03/97	2
La Piscina de Yuriria	X					31/03/97	1
Rincon de Parangueo#	X					01/04/97	1
<b>Jalisco</b>							
Arroyo del Atajo					X	24/03/97	1
Arroyo el Puerto	X				X	26/03/97	2
Lago Atotonilco	X					29/03/97	1
Lago Cajititlan	X		X			30/03/97	2
Lago Chapala	X		X			29/03/97	2
Laguna de Juanacatlan	XX	X	XX	XX		25/03/97	7
		XXX		X		26/02/98	4
			XXXX			11/09/98	4
La Yerbabuena	X		X			28/03/97	2
Laguna Potrerillo	X		X			27/03/97	3
<b>Michoacan</b>							
Lago de Cuitzeo	X		X			31/03/97	2
Lago de Patzcuaro	X		X			03/04/97	2
Lago de Zirahuen	XX	X	XXX			02/04/97	6
Lago de Zirahuen#	XXXXXX*					26/11/95-20/07/96	6
Lagunilla de San Gregorio	X					15/09/98	1
Rio de la Palma#					X	02/04/97	1
<b>Oriental Basin</b>							
Laguna Alchichica	X	X			X	08/04/97	3
Laguna Preciosa	XX	X	X			08/04/97	4
Laguna Quechulac	X	X	XX			08/04/97	4
Totolcingo#	X			X		08/04/97	2

**Table 5.2:** List of diatom samples collected from central Mexican lakes (#no chemistry data, \* samples provided by UMSNH). Further information on individual samples is provided in Appendix 4.

Location	pH	E.C.	K meq/l	Na meq/l	Mg meq/l	Ca meq/l	SO4 meq/l	Cl meq/l	CO3 meq/l	HCO3 meq/l
La Alberca	9.43	6030	6.46	35.50	8.70	0.05	3.56	9.87	33.63	26.60
Laguna Alchichica	9.02	10140	5.91	103.31	36.13	0.51	17.71	84.63	22.39	18.75
Lago de Atotonilco	9.47	11260	3.90	139.01	1.76	2.59	19.28	44.43	46.18	31.87
Lago de Cajititlan	8.20	756	0.87	4.49	1.99	1.68	0.15	0.85	0.65	6.29
Lago de Chapala	8.60	954	0.70	5.39	10.18	2.99	1.77	1.13	1.35	6.08
Lago de Cuitzeo	9.12	3400	1.28	64.92	1.60	2.51	3.49	10.49	8.03	13.55
Lago de Juanacatlan	8.28	148	0.06	0.30	0.35	0.86	0.11	0.06	0.08	1.31
Lago de Patzcuaro	8.86	1021	1.07	6.64	3.31	0.75	1.12	0.91	2.19	8.29
Laguna Potrerillo	6.82	158	0.27	0.35	0.44	0.68	0.02	0.08	0.00	1.41
Laguna Preciosa	8.64	2090	0.44	8.11	16.29	0.76	2.74	7.84	4.17	9.11
Laguna Quechulac	8.69	840	0.19	3.17	4.42	1.01	0.35	2.06	1.17	5.17
Lagunilla de San Gregorio	6.45	30	0.03	0.06	0.10	0.16	0.08	0.03	0.00	0.24
Lago de Yuriria	8.23	1885	1.32	14.80	3.11	4.15	0.21	4.01	3.47	13.37
La Piscina de Yuriria	10.04	8130	6.99	95.79	1.86	5.91	9.19	27.50	58.23	10.04
Lago de Zirahuen	8.23	119	0.09	0.25	0.49	0.44	0.01	0.10	0.08	1.02

**Table 5.3:** Results of laboratory water chemistry analyses.



Lake	Type	Lat.	Long.	Alt. (m a.s.l.)	Sample Code	Date Sampled	pH	E.C.	K meq	Na meq	Mg meq	Ca meq	SO4 meq	Cl meq	CO3 meq
Hoya La Alberca, Zacapu Basin	Crater lake	19 52	101 50	1980	1i, 1ii	23/06/1982	9.00	3600	0.51	6.09	6.25	2.15	0.34	5.64	6.00
Lago Alchichica	Crater lake	19 24	97 24	2345	2a	08/04/1997	9.31	10140	5.91	103.31	36.13	0.51	17.71	84.63	41.13
					2b	01/08/1982	8.80	7521	5.90	108.10	33.70	0.25	24.90	85.10	28.75
El Angulo, Zacapu Basin	Irrigation channel	19 54	101 45	1980	3	21/06/1982	7.30	305	0.06	3.04	0.08	1.10	1.37	0.21	1.80
Lago de Atotonilco	Lake	20 34	103 70	1600	4	29/03/1997	9.69	11260	3.90	139.01	1.76	2.59	19.28	44.43	78.04
Lago de Cajititan	Lake	20 42	103 35	1570	5	30/03/1997	8.65	756	0.87	4.49	1.99	1.68	0.15	0.85	6.94
Lago de Chapala	Lake	20 15	103 50	1523	6	29/03/1997	8.59	954	0.70	5.39	10.18	2.99	1.77	1.13	7.43
Lago de Chalco	Lake	19 15	98 55	2240	7i, 7ii	16/01/1991	9.20	2420	1.25	23.70	8.81	4.03	14.31	4.79	18.71
Lago de Juanacatlan	Lake	20 37	104 44	1995	8i, 8ii	25/03/1997	8.78	148	0.06	0.30	0.35	0.86	0.11	0.06	1.39
Lagunilla de San Gregorio	Lake	19 25	101 30	3100	9	15/09/1998	6.45	30	0.03	0.06	0.10	0.16	0.08	0.03	0.24
Lago de Yuriria	Lake	20 15	101 10	1730	10	31/03/1997	8.69	1885	1.32	14.80	3.11	4.15	0.21	4.01	16.84
Lago de la Luna	Crater lake	19 10	99 45	4550	11i, 11ii	03/03/1991	4.90	17	0.00	0.00	0.89	0.00	0.79	0.00	0.10
Lago del Sol	Crater lake	19 10	99 45	4550	12i, 12ii, 12iii	03/03/1991	5.80	24	0.00	0.00	0.32	0.00	0.12	0.00	0.20
Lago de Patzcuaro	Lake	19 35	101 39	2044	13a	28/03/1982	7.50	800	0.69	6.05	3.04	0.67	1.03	0.56	6.70
					13b	03/04/1997	8.86	1021	1.07	6.64	3.31	0.75	1.12	0.91	10.48
Laguna Potrerillo	Pool	20 34	104 51	1250	14	27/03/1997	7.45	158	0.27	0.35	0.44	0.68	0.12	0.08	1.41
Laguna Preciosa	Crater lake	19 21	97 22	2365	15i, 15ii	08/04/1997	8.90	2090	0.44	8.11	16.29	0.76	2.74	7.84	13.28
La Piscina de Yuriria	Crater lake	20 13	101 08	1730	16a	08/04/1982	11.00	26000	30.68	478.50	0.02	0.00	29.34	174.25	300.00
					16b	31/03/1997	10.18	8130	6.99	95.79	1.86	5.91	9.19	27.50	68.25
Querendaro	Pool	19 49	100 57	2070	17	19/06/1982	6.60	180	0.16	0.78	0.64	0.72	0.51	0.85	1.80
Laguna Quechulac	Crater lake	19 21	97 21	2395	18	08/04/1997	8.82	840	0.19	3.17	4.42	1.01	0.35	2.06	5.17
Tarajero, Zacapu Basin	Pool	19 49	101 43	1980	19	21/06/1982	7.80	195	0.07	0.67	0.93	0.73	0.51	0.14	2.20
Lago Tecocomulco	Lake	19 50	98 21	2500	20	02/04/1992	6.80	250	0.49	1.57	0.70	0.74	1.26	0.24	2.00
Lago Recreativo (Texcoco)	Lake	19 30	99 00	2236	21i, 21ii	16/04/1992	9.60	7500	2.30	54.80	12.45	2.20	0.00	67.69	2.07
Jalapango marsh (Texcoco)	Marsh	19 30	99 00	2236	22i, 22ii	16/04/1992	9.10	2360	2.62	36.10	1.92	1.00	21.38	7.61	12.63
Artemia Pond (Texcoco)	Pool	19 30	99 00	2236	23	16/04/1992	9.50	44100	25.58	434.95	2.06	4.13	2.04	259.47	207.00
Xochimilco	Irrigation channel	19 17	99 10	2240	24	04/08/1982	8.00	638	0.30	4.40	3.45	2.14	2.20	1.47	5.70
Lago Zacapu	Lake	19 49	101 48	1980	25i, 25ii, 25iii	23/04/1982	8.80	146	0.01	0.58	0.50	0.43	0.69	0.14	1.80
Zacapu Celanese	Drainage channel	19 50	101 48	1980	26i, 26ii, 26iii	19/04/1982	8.80	1000	0.06	9.57	0.44	0.60	10.47	0.42	1.40
Zempoala stream	Stream	19 03	99 19	2730	27	02/02/1991	7.40	105	0.05	0.20	0.42	0.45	0.17	0.04	0.91
Lago Zempoala	Lake	19 03	99 19	2730	28i, 28ii, 28iii	02/02/1991	7.70	91	0.03	0.13	0.33	0.45	0.04	0.04	0.84
Lago de Compila (Zempoala)	Lake	19 03	99 19	2730	29i, 29ii	02/02/1991	6.50	102	0.05	0.17	0.51	0.45	0.17	0.03	0.96
Lago de Zirahuen	Lake	19 21	101 46	2075	30ai, 30aii	02/04/1997	8.40	119	0.09	0.25	0.49	0.44	0.01	0.10	1.70
					30b	20/06/1982	8.60	102	0.06	0.19	0.43	0.47	0.34	0.00	1.70
Lago de Zumpango	Lake	19 46	99 07	2242	31ai, 31aii	13/02/1991	7.20	507	0.28	2.20	0.89	1.85	0.45	0.71	4.02
					31b	13/02/1991	7.30	508	0.29	2.33	0.84	1.80	0.47	0.72	4.03

Table 5.5: Selected geographical information, sample codes and water chemistry data for samples included in the dataset.

Core	Depth (cm)	Laboratory Code	$^{14}\text{C}$ Age ( $\pm 1\sigma$ )	$\delta^{13}\text{C}_{\text{PDB}} \pm 0.1 \text{ ‰}$	Calibrated Age AD	Calibrated Age Range AD ( $2\sigma$ )
ZIR1	86-91	GU 4912	$200 \pm 100$	-26.1	1668, 1782, 1795	1467-1955
ZIR1	182-187	GU 4913	$330 \pm 100$	-26.1	1522, 1573, 1627	1412-1948
AV/98	39-40	AA 33836	$410 \pm 60$	-27.1	1452	1410-1640
AV/98	61-62	AA 32321	$875 \pm 45$	-25.2	1164, 1169, 1186	1029-1262
ZL/98	50-51	AA 32322	$965 \pm 45$	-24.2	1031	993-1188
ZD/98	53-54	CAMS 59466	$1390 \pm 40$	-24.2	656	601-688
ZD/98	68-69	CAMS 54448	$910 \pm 50$	-28.2	1071, 1079, 1128	1019-1245

**Table 6.1:** Radiocarbon assays for Lago de Zirahuén. Laboratory identifiers are: GU - Scottish Universities Environmental Research Centre; AA - University of Arizona AMS Facility; CAMS - Lawrence Livermore National Laboratory Centre for Accelerator Mass Spectrometry. Samples with AA and CAMS codes are AMS  $^{14}\text{C}$  dates. Samples with the GU code are conventional dates. Dates are calibrated using CALIB 4.1 (Stuiver and Reimer, 1993).

Depth (cm)	Activity in Section (Bq)	CRS Age (y) ( $1\sigma$ )	CIC Age (y) ( $23\text{mg cm}^{-2}\text{ y}^{-1}$ )	CIC Age (y) ( $18\text{mg cm}^{-2}\text{ y}^{-1}$ )
0-1	0.536	$3.87 \pm 0.2$	2.2	2.8
1-2	0.642	$8.34 \pm 0.5$	7.3	9.2
2-3	0.784	$13.54 \pm 0.9$	13.6	17.2
3-4	0.564	$19 \pm 1.2$	20.8	26.4
4-5	0.722	$27.56 \pm 1.8$	28.3	35.9
5-6	0.609	$37.19 \pm 2.4$	36.2	46.0
6-7	0.452	$46.8 \pm 3.0$	44.7	56.9
7-8	0.258	$53.9 \pm 3.4$	54.1	68.7
8-9	0.106	$57.4 \pm 3.7$	64.0	81.3
9-10	0.136	$62.5 \pm 4.0$	75.0	95.2
10-11	0.019	$63.2 \pm 4.0$	85.3	108.5
11-12	0.168	$71.0 \pm 4.5$	93.9	119.4
12-13	0.121	$78.1 \pm 5.0$	102.4	130.2
13-14	0.212	$96.4 \pm 6.1$	111.9	142.3
14-15	0		121.6	154.5
15-16	0.188	$132.7 \pm 8.5$	131.3	166.9
16-17	0.056	$163.9 \pm 10.5$	142.0	180.5
17-18	0.016	$184.4 \pm 12.0$	153.2	184.7
18-19	0		166.3	200.3
19-20	0.018		178.8	227.2

**Table 6.2:**  $^{210}\text{Pb}$  chronology for core AV/98 using the CRS and CIC models.

Sample Number	Description of Sample Location	Latitude (°N)	Longitude (°W)	$\chi \mu\text{m}^3 \text{kg}^{-1}$
1	Rio de la Palma (near Iricuaro)	19°25'	101°40'	9.49
2	Pasture Field (near La Cruz)	19°24'50	101°41'10	12.12
3	Drainage ditch (near blackberry farm at Tepami)	19°25'50	101°44'50	13.83
4	Cultivated soil (blackberry farm at Tepami)	19°25'50	101°44'50	13.17
5	Maize field (near bridge over Rio de la Palma)	19°25'50	101°43'50	8.75
6	Mouth of Rio de la Palma	19°25'60	101°44'50	8.42
7	Cerro Colorado	19°26'70	101°43'20	12.66
8	Arroyo Zirahuén	19°27'	101°43'80	13.23
9	Between Zirahuén and Copandaro	19°26'50	101°44'90	10.79
10	Forested slopes around Agua Verde	19°25'50	101°45'50	5.23
11	Maize field past Agua Verde village	19°24'50	101°44'60	12.83

**Table 6.3:** Magnetic susceptibility of soil samples from the Zirahuén Basin.

Sample Number	Description of Sample	GPS (lat)	GPS (long)	$\chi \mu\text{m}^3 \text{kg}^{-1}$
1	From alluvial section at mouth of A. de Laguna de Juanacatlán.	2280890	0528064	0.74
2	Sandy material from steep, pine covered slope on north-eastern side of lake.	2281055	0527814	0.96
3	From the bed of a dried-out stream close to Cerro el Malpais.	2281158	0527561	0.26
4	C horizon of an exposed section at the edge of the road (western end).	2280642	0527537	1.24
5	A/B horizon of above.	2280642	0527537	0.23
6	Soil profile along road on southern edge of lake (with charcoal).	2280842	0527818	0.34
7	As above without charcoal	2280842	0527818	0.30

**Table 7.1:** Magnetic susceptibility of soil samples from Laguna de Juanacatlán.

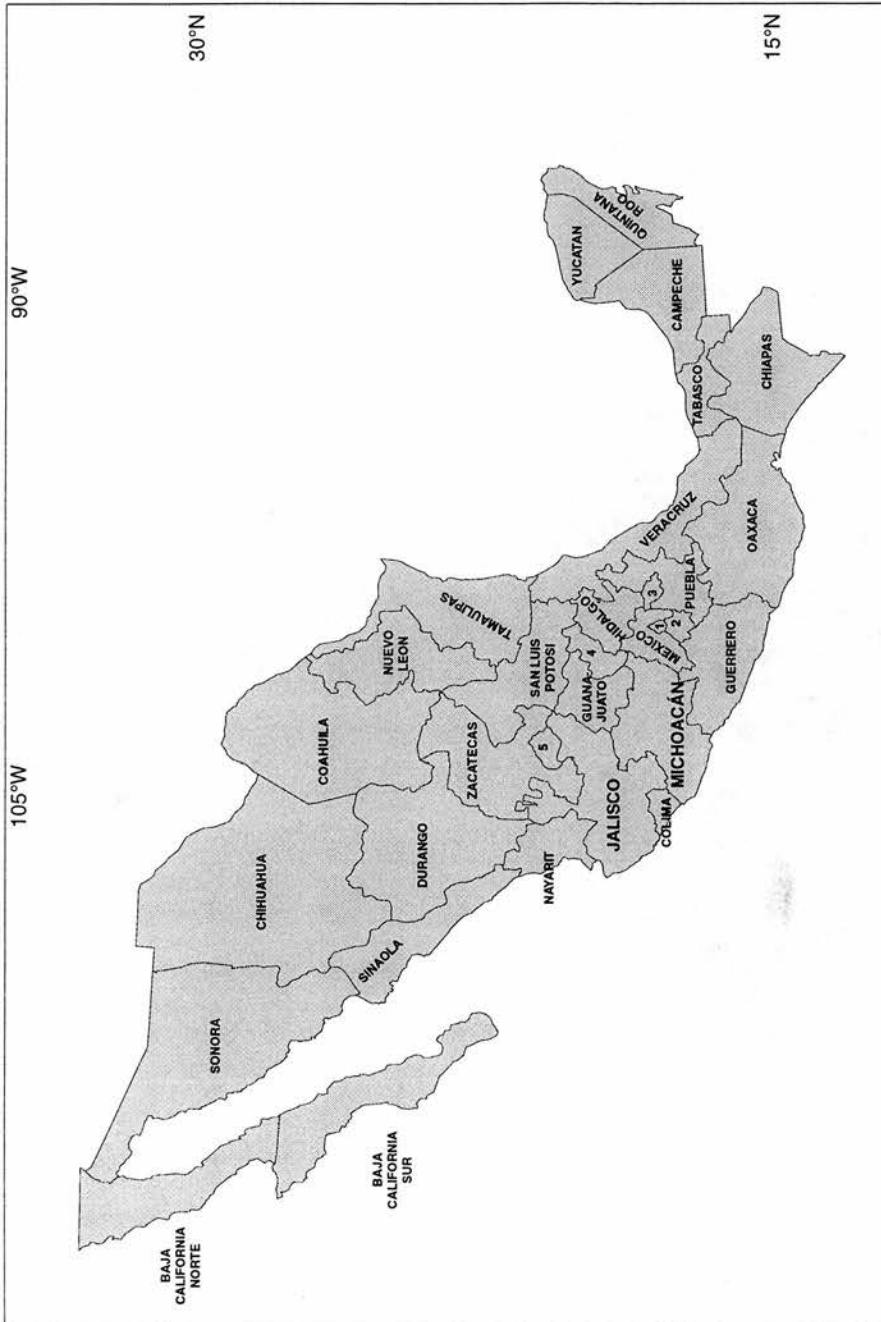
Depth (cm)	Activity in section (Bq)	Activity below section (Bq)	CRS age (Yr)	CIC age (Yr)
0-1	0.231	1.257	5.43	2.5
1-2	0.160	1.097	9.81	9.4
2-3	0.250	0.847	18.12	18.3
3-4	0.311	0.536	32.8	28.5
4-5	0.239	0.397	51.8	39.7
5-6	0.297			52.8

**Table 7.2:** CRS and CIC  $^{210}\text{Pb}$  ages derived for core JL/98.

Core	Depth (cm)	Laboratory Code	<sup>14</sup> C age (± 1σ)	<sup>13</sup> C <sub>PDB</sub> (± 0.1‰)	Calibrated Age AD	Calibrated Age Range (AD: 2σ)
JL/98	36-37	AA-32323	365 ± 45	-30.1	1488, 1605	1439-1644
JL/98	69-70	AA-32324	485 ± 50	-31.4	1432	1330-1380
JD/98	49-50	AA-32325	395 ± 55	-30.2	1473	1420-1640
JD/98	74-75	AA-33835	635 ± 40	-28.7	1303, 1368, 1383	1284-1406
JR/98	75-76	CAMS-54447	250 ± 40	-26.7	1652	1522-1946

**Table 7.3:** Radiocarbon assays for Laguna de Juanacatlán. All of the above are AMS dates. Laboratory codes are: AA – University of Arizona AMS facility; CAMS – Lawrence Livermore National Centre for Accelerator Mass Spectrometry. Ages were calibrated using CALIB 4.1 (Stuiver and Reimer, 1993).

# Appendix 1: The States of Mexico



**1:** Distrito Federal, **2:** Morelos, **3:** Tlaxcala, **4:** Queretaro, **5:** Aguascalientes

## Appendix 2: Models for the calculation of $^{210}\text{Pb}$ ages

### The C.I.C. model

The C.I.C. model is based on the assumption that there is a constant supply of unsupported  $^{210}\text{Pb}$  to the lake sediment and that the rate of sediment accumulation rate is also constant. A graph of the natural logarithm of unsupported  $^{210}\text{Pb}$  against depth is plotted and the gradient obtained from the best fitting straight line. Using

$$A_t = A_s e^{-\lambda t},$$

where  $A_s$  is activity at time  $t$ ,  $A_t$  is activity at the sediment-water interface and  $\lambda$  is the radionuclide decay constant, sedimentation rate and depth are substituted for time, since

$$t = \frac{Z}{\text{SR}},$$

where  $Z$  is depth and  $\text{SR}$  is sedimentation rate. The equation then becomes:

$$A_t = A_s e^{-\lambda Z/\text{SR}}$$

or,

$$\ln A_t = \ln A_s - \lambda Z/\text{SR}$$

therefore,

$$Z = -\text{SR}/\lambda \ln A_t + \text{SR}/\lambda \ln A_s \quad (y = mx + c)$$

The gradient of the straight line can therefore be used to calculate the sedimentation rate using the following:

$$g = \frac{\text{SR}}{\lambda}$$

$^{210}\text{Pb}$  ages can thus be derived for core samples.

### The C.R.S. model

The C.R.S. model was initially developed by Goldberg (1963), although has not been widely used until more recently. This model is based on the assumption that the supply of unsupported  $^{210}\text{Pb}$  is constant, but does not require a constant sedimentation rate. Ages using this model are estimated by calculating the total inventory of unsupported  $^{210}\text{Pb}$  in the sediment core and the amount of unsupported  $^{210}\text{Pb}$  below the base of each section. The following equation is used to calculate the age of each section:

$$t_i = \frac{1}{\lambda} \ln \frac{I}{I_i}$$

where  $t_i$  is the age of the  $i^{\text{th}}$  layer,  $\lambda$  is the decay constant,  $I$  is the total unsupported  $^{210}\text{Pb}$  inventory and  $I_i$  is the unsupported  $^{210}\text{Pb}$  inventory below the  $i^{\text{th}}$  layer. This model is particularly appropriate when other lines of evidence indicate that sedimentation rates have not remained constant through time.

### Appendix 3: List of diatom taxa recorded in modern samples from Central Mexico taken during this study.

<b>Achnanthes</b>	<b>Code</b>
<i>A. delicatula</i> (Kützing) Grunow,	AC016A
<i>A. exigua</i> Grunow,	AC008A
<i>A. grana</i> Hohn & Hellermann,	AC158A
<i>A. hungarica</i> Grunow,	AC032A
<i>A. lanceolata</i> Brébisson,	AC001A
<i>A. lanceolata</i> var. <i>dubia</i> Grunow,	AC001D
<i>A. lanceolata</i> ssp. <i>rostrata</i> (Oestrup) Lange-Bertalot,	AC001B
<i>A. linearis</i> (W. Smith) Grunow	AC002A
<i>A. minutissima</i> Kützing,	AC013A
<b>Amphora</b>	
<i>A. bullatoides</i> Hohn & Hellermann,	AM118A
<i>A. coffeaeformis</i> (Agardh) Kützing,	AM006A
<i>A. commutata</i> Grunow,	AM007A
<i>A. montana</i> Krasske,	AM084A
<i>A. ovalis</i> (Kützing) Kützing,	AM001A
<i>A. ovalis</i> var. <i>affine</i> (Kützing) Van Heurck,	AM001D
<i>A. pediculus</i> (Kützing) Grunow,	AM012A
<i>A. perpusilla</i> Grunow,	AM003A
<i>A. veneta</i> Kützing,	AM004A
<b>Anomoeoneis</b>	
<i>A. costata</i> (Kützing) Hustedt,	AN005A
<i>A. sphaerophora</i> (Ehrenberg) Pfitzer,	AN009A
<i>A. sphaerophora</i> f. <i>sculpta</i> (Ehrenberg) O. Müller,	AN009B
<b>Aulacoseira</b>	
<i>A. ambigua</i> (Grunow) Simonsen,	AU002A
<i>A. distans</i> var. <i>alpigena</i> Grunow,	AU005H
<i>A. granulata</i> (Ehrenberg) Simonsen,	AU003A
<i>A. granulata</i> var. <i>angustissima</i> , (Müller) Simonsen,	AU003C
<i>A. granulata</i> var. <i>valida</i> (Hustedt) Simonsen,	ME003D
<i>A. italica</i> (Ehrenberg) Simonsen,	AU001A
<i>A. italica</i> var. <i>tenuissima</i> (Grunow) Simonsen,	AU001E
<b>Brachysira</b>	
<i>B. neoexilis</i> Lange-Bertalot,	BR010A
<i>B. vitrea</i> (Grunow) Ross,	BR001A
<i>B. zellensis</i>	BR005A

<b>Caloneis</b>	<b>Code</b>
<i>C. alpestris</i> (Grunow) Cleve,	CA014A
<i>C. schummaniana</i> (Grunow) Cleve,	CA004A
<b>Chaetoceros</b>	
<i>C. muelleri</i> Lemmerman,	CH057A
<b>Cocconeis</b>	
<i>C. diminuta</i> Pantocsek,	CO006A
<i>C. pediculus</i> Ehrenberg,	CO005A
<i>C. placentula</i> var. <i>euglypta</i> , (Ehrenberg) Grunow,	CO001B
<i>Cocconeis placentula</i> var. <i>lineata</i> (Ehrenberg) Van Heurck,	CO001C
<i>Cocconeis thumensis</i> Mayer,	CO009A
<b>Cyclotella</b>	
<i>C. caspia</i> Grunow,	CY012A
<i>C. distinguenda</i> Hustedt,	CY028A
<i>C. meneghiniana</i> Kützing,	CY003A
<i>C. ocellata</i> Pantocsek,	CY009A
<i>C. quillensis</i> Bailey,	CY017A
<i>C. stelligera</i> Cleve & Grunow,	CY004A
<b>Cymatopleura</b>	
<i>C. solea</i> (Brébisson) W. Smith,	CL001A
<b>Cymbella</b>	
<i>C. aequalis</i> W. Smith in Greville,	CM014A
<i>C. affinis</i> Kützing,	CM022A
<i>C. amphicephala</i> Naegeli in Kützing,	CM016A
<i>C. aspera</i> (Ehrenberg) Peragallo,	CM005A
<i>C. cymbiformis</i> C. Agardh,	CM007A
<i>C. cymbiformis</i> f. <i>nonpunctata</i> Fontell,	CM007B
<i>C. mexicana</i> (Ehrenberg) Cleve,	CM032A
<i>C. microcephala</i> Grunow,	CM004A
<i>C. minuta</i> Hilse ex Rabenhorst,	CM031A
<i>C. minuta</i> var. <i>silesiaca</i> (Bleisch) Reimer,	CM031C
<i>C. pusilla</i> Grunow,	CM023A
<i>C. sinuata</i> Gregory,	CM003A
<i>C. tumidula</i> Grunow in A. Schmidt <i>et al.</i> ,	CM109A
<b>Denticula</b>	
<i>D. elegans</i> Kützing,	DE002A
<b>Diploneis</b>	
<i>D. elliptica</i> (Kützing) Cleve,	DP009A
<i>D. oblongella</i> (Naegeli) Cleve-Euler,	DP007A
<i>D. oculata</i> (Brébisson) Cleve,	DP003A

	<b>Code</b>
<i>D. ovalis</i> , (Hilse) Cleve,	DP001A
<i>D. puella</i> (Schumman) Cleve,	DP006A
<i>D. smithii</i> (Brébisson) Cleve,	DP005A
<b>Entonomeis</b>	
<i>E. alata</i> (Ehrenberg) Ehrenberg,	EN003A
<b>Epithemia</b>	
<i>E. adnata</i> (Kützing) Brébisson,	EP007A
<i>E. adnata</i> var. <i>porcellus</i> (Kützing) Patrick,	EP007E
<i>E. adnata</i> var. <i>probiscidea</i> , (Kützing) Patrick,	EP007F
<i>E. argus</i> (Ehrenberg) Kützing,	EP003A
<i>E. hyndmannii</i> W. Smith,	EP005A
<i>E. sorex</i> Kützing,	EP001A
<i>E. turgida</i> (Ehrenberg) Kützing,	EP004A
<i>E. turgida</i> var. <i>westermanni</i> (Ehrenberg) Grunow,	EP004C
<b>Eunotia</b>	
<i>E. eruca</i> Ehrenberg,	EUERUC
<i>E. flexuosa</i> (Brébisson) Kützing,	EU017A
<i>E. incisa</i> Gregory,	EU047A
<i>E. naegelii</i> Migula,	EU048A
<i>E. pectinalis</i> var. <i>minor</i> (Kützing) Rabenhorst,	EU002E
<b>Fragilaria</b>	
<i>F. brevistriata</i> Grunow,	FR006A
<i>F. capucina</i> Desmazières,	FR009A
<i>F. capucina</i> var. <i>mesolepta</i> Rabenhorst,	FR009B
<i>F. construens</i> (Ehrenberg) Ralfs,	FR002A
<i>F. construens</i> var. <i>venter</i> (Ehrenberg) Grunow,	FR002C
<i>F. crotonensis</i> Kitton,	FR008A
<i>F. lapponica</i> Grunow,	FR011A
<i>F. pinnata</i> Ehrenberg,	FR001A
<i>F. pinnata</i> var. <i>lancettula</i> (Schummann) Hustedt,	FR001B
<i>F. vaucheriae</i> (Kützing) Peters,	FR007A
<i>F. vaucheriae</i> var. <i>capitellata</i> (Grunow) Patrick,	FR007C
<b>Frustulia</b>	
<i>F. rhomboides</i> var. <i>crassinervia</i> (Brébisson) Ross,	FU002K
<i>F. vulgaris</i> (Thwaites) De Toni,	FU001A
<b>Gomphonema</b>	
<i>G. acuminatum</i> Ehrenberg,	GO006A
<i>G. affine</i> Kützing,	GO020A
<i>G. augur</i> var. <i>turris</i> (Ehrenberg) Lange-Bertalot,	GO021A
<i>G. clevei</i> Fricke,	GO024A
<i>G. gracile</i> Ehrenberg,	GO004A

	<b>Code</b>
<i>G. grunowii</i> Patrick,	GO026A
<i>G. intricatum</i> Kützing,	GO014A
<i>G. intricatum</i> var. <i>pusilla</i> Mayer,	GO014D
<i>G. olivaceum</i> (Hornemann) Brébisson,	GO001A
<i>G. parvulum</i> (Kützing) Kützing,	GO013A
<i>G. sphaerophorum</i> Kützing,	GO012A
<i>G. subclavatum</i> var. <i>commutatum</i> (Grunow) A. Mayer,	GO011C
<i>G. subclavatum</i> var. <i>mexicanum</i> (Grunow) Patrick,	GO011C
<i>G. subtile</i> var. <i>sagitta</i> (Schumman) Cleve,	GO008B
<b>Gyrosigma</b>	
<i>G. obtusatum</i> (Sullivan & Wormley) Boyer,	GYOB
<b>Hantzschia</b>	
<i>H. amphioxys</i> (Ehrenberg) W. Smith,	HA001A
<b>Mastogloia</b>	
<i>M. elliptica</i> C. Agardh,	MA002C
<i>M. elliptica</i> var. <i>dansei</i>	MA002B
<i>M. smithii</i> Thwaites,	MA001A
<i>M. smithii</i> var. <i>lacustris</i> , Grunow,	MA001B
<b>Melosira</b>	
<i>M. roseana</i> Rabenhorst,	ME039A
<b>Navicula</b>	
<i>N. capitata</i> Ehrenberg,	NA066A
<i>N. capitata</i> var. <i>hungarica</i> (Grunow) Ross,	NA066B
<i>N. cincta</i> (Ehrenberg) Ralfs,	NA021A
<i>N. confervacea</i> Kützing,	NA118A
<i>N. constans</i> var. <i>symmetrica</i> Hustedt,	NA171A
<i>N. cryptocephala</i> Kützing,	NA007A
<i>N. cuspidata</i> (Kützing) Kützing,	NA056A
<i>N. cymbula</i> Donkin,	NA314A
<i>N. detenta</i> Hustedt,	NA322A
<i>N. digitoradiata</i> (Gregory) Ralfs,	NA060A
<i>N. elkab</i> Müller,	NA730A
<i>N. globosa</i> Meister,	NA399A
<i>N. graciloides</i> Mayer,	NA055A
<i>N. halophila</i> (Grunow) Cleve,	NA022A
<i>N. heufleri</i> var. <i>leptocephala</i> (Brébisson ex. Grunow) Peragallo,	NA094B
<i>N. laevissima</i> Kützing,	NA102A
<i>N. menisculus</i> Schumman,	NA030A
<i>N. miniscula</i> Grunow,	NA112A
<i>N. modica</i> Hustedt,	NA123A
<i>N. mutica</i> Kützing,	NA025A

	<b>Code</b>
<i>N. oblonga</i> Kützing,	NA024A
<i>N. pelliculosa</i> (Brébisson) Hilse,	NA138A
<i>N. peregrina</i> (Ehrenberg) Kützing,	NA562A
<i>N. phyllepta</i> Kützing,	NA058A
<i>N. pupula</i> Kützing,	NA014A
<i>N. pygmaea</i> Kützing,	NA010A
<i>N. radiosa</i> Kützing,	NA003A
<i>N. radiosa</i> var. <i>tenella</i> (Brébisson) Van Heurck,	NA003B
<i>N. salinarium</i> var. <i>intermedia</i> (Grunow) Cleve,	NA035B
<i>N. seminulum</i> Grunow,	NA005A
<i>N. subrotundata</i> Hustedt,	NA114A
<i>N. tenelloides</i> Hustedt,	NA675A
<i>N. trivialis</i> Lange-Bertalot,	NA063A
<i>N. viridula</i> var. <i>linearis</i> Hustedt,	NA027E
<i>N. vitabunda</i> Hustedt,	NA168A

### **Nitzschia**

<i>N. acidoclinata</i> Lange-Bertalot,	NI030A
<i>N. amphibia</i> Grunow,	NI014A
<i>N. amphibia</i> f. <i>rostrata</i> Hustedt,	NIAMPR
<i>N. communis</i> Rabenhorst,	NI010A
<i>N. denticula</i> var. <i>delongei</i> Grunow,	NI003B
<i>N. epiphytica</i> O. Müller,	NIEPI
<i>N. fonticola</i> Grunow,	NI002A
<i>N. frustulum</i> (Kützing) Grunow,	NI008A
<i>N. gracilis</i> Hantzsch,	NI017A
<i>N. hantzschiana</i> Rabenhorst,	NI034A
<i>N. inconspicua</i> Grunow,	NI043A
<i>N. linearis</i> (Agardh) W. Smith,	NI031A
<i>N. microcephala</i> Grunow,	NI027A
<i>N. palea</i> (Kützing) W. Smith,	NI009A
<i>N. paleacea</i> Grunow,	NI033A
<i>N. perminuta</i> (Grunow) Peragallo	NI005A
<i>N. perspicua</i> Chohnoky,	NI191A
<i>N. romana</i> Grunow,	NI026A
<i>N. sociabilis</i> Hustedt,	NI166A
<i>N. sigma</i> (Kützing) W. Smith,	NI006A
<i>N. subacicularis</i> Hustedt,	NI171A
<i>N. tubicola</i> Grunow,	NITUBI
<i>N. valdestriata</i> Aleem & Hustedt,	NI186A

### **Opephora**

<i>O. martyii</i> Héribaud,	OP001A
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### **Pinnularia**

<i>P. abaujensis</i> var. <i>linearis</i> (Hustedt) Patrick,	PI015C
<i>P. borealis</i> Ehrenberg,	PI012A

	<b>Code</b>
<i>P. gibba</i> Ehrenberg,	PI001A
<i>P. maior</i> (Kützing) Rabenhorst,	PI005A
<i>P. microstauron</i> (Ehrenberg) Cleve,	PI011A
<i>P. cf. microstauron</i> (Ehrenberg) Cleve,	PILAGU
<i>P. subcapitata</i> Gregory,	PI022A
<i>P. viridis</i> (Nitzsch) Ehrenberg,	PI007A
<b><i>Rhoicosphenia</i></b>	
<i>R. curvata</i> Kützing,	RC001A
<b><i>Rhopalodia</i></b>	
<i>R. acuminata</i> Krammer,	RH010A
<i>R. gibba</i> Müller,	RH001A
<i>R. gibberula</i> var. <i>vanheurckii</i> (coarse type) Müller,	RH003CO
<i>R. gibberula</i> var. <i>vanheurckii</i> (fine type) Müller,	RH003FI
<i>R. gibberula</i> var. <i>protracta</i>	RH003B
<i>R. musculus</i> (Kützing) O. Müller,	RH002A
<i>R. operculata</i> (Agardh) Håkansson,	RH006A
<b><i>Stauroneis</i></b>	
<i>S. anceps</i> Ehrenberg,	SA001A
<i>S. phoenicentron</i> (Nitzsch) Ehrenberg,	SA006A
<b><i>Stenopterobia</i></b>	
<i>Stenopterobia</i> spp.	STSP
<b><i>Stephanodiscus</i></b>	
<i>S. asteroides</i> Gasse,	N/A
<i>S. asteroides</i> var. <i>intermedia</i> Gasse,	ST011B
<i>S. astraea</i> (Ehrenberg) Grunow,	ST003A
<i>S. astraea</i> var. <i>intermedia</i> Gasse,	ST003D
<i>S. minutulus</i> (Kützing) Cleve & Möller,	ST021A
<i>S. parvus</i> Stoermer & Håkansson,	ST010A
<i>S. sp. 1</i> (Lago Cajititlán)	STCAJI
<i>S. sp. 2</i> (Lago de Chapala)	STCHAP
<b><i>Surirella</i></b>	
<i>S. bifrons</i> Ehrenberg,	SU074A
<i>S. elegans</i> Ehrenberg,	SU012A
<i>S. tenera</i> Gregory,	SU007A
<b><i>Synedra</i></b>	
<i>S. acus</i> Kützing,	SY003A
<i>S. goulardii</i> Brébisson,	SY014A
<i>S. montana</i> Krasske,	SY061A
<i>S. nana</i> Meister,	SY009A
<i>S. radians</i> Kützing,	SY017A

*S. rumpens* Kützing,  
*S. fasciculata* (C. Agardh) Kützing,  
*S. tenera* W. Smith,  
*S. ulna* (Nitzsch) Ehrenberg,  
*S. ulna* var. *oxyrhyncus* f. *mediocontracta*,

**Code**

SY002A  
SY005A  
SY013A  
SY001A  
SY001D

## Appendix 4: Modern Diatom Sample Counts

Relative abundance of diatom taxa found in modern samples, expressed as percentages.

### Laguna Alchichica

	ALCH /REEF	ALCH /SED
<b>Sample depth</b>	0.5m	17m
<b>Species</b>		
<i>Achnanthes delicatula</i>	-	0.5
<i>Amphora coffeaeformis</i>	0.24	2.77
<i>Amphora pediculus</i>	1.20	3.27
<i>Amphora perpusilla</i>	0.72	-
<i>Amphora veneta</i>	0.96	-
<i>Anomoeoneis costata</i>	-	0.76
<i>Aulacoseira granulata</i> var. <i>valida</i>	-	0.76
<i>Cocconeis thumensis</i>	-	0.5
<i>Cocconeis placentula</i> var. <i>euglypta</i>	2.17	5.79
<i>Cocconeis placentula</i> var. <i>lineata</i>	-	3.53
<i>Cyclotella caspia</i>	6.27	4.53
<i>Cyclotella quillensis</i>	2.89	4.28
<i>Cymbella pusilla</i>	30.36	0.76
<i>Diploneis elliptica</i>	0.72	-
<i>Diploneis oblongella</i>	2.65	-
<i>Diploneis smithii</i>	1.93	0.25
<i>Epithemia argus</i>	11.33	0.76
<i>Epithemia sorex</i>	0.24	-
<i>Mastogloia elliptica</i>	3.13	1.51
<i>Mastogloia smithii</i>	13.01	-
<i>Navicula capiata</i> var. <i>hungarica</i>	-	2.77
<i>Navicula cuspidata</i>	0.24	-
<i>Navicula laevissima</i>	-	0.25
<i>Navicula peregrina</i>	0.24	-
<i>Navicula radiosa</i> var. <i>tenella</i>	0.96	25.94
<i>Nitzschia inconspicua</i>	1.2	18.89
<i>Nitzschia microcephala</i>	6.75	2.77
<i>Nitzschia palea</i>	0.24	1.26
<i>Nitzschia paleacea</i>	-	0.25
<i>Nitzschia romana</i>	10.12	8.56
<i>Rhopalodia gibberula</i> var. <i>van heurckii</i> (coarse type)	0.24	1.26
<i>Rhopalodia musculus</i>	0.24	-
<i>Stephanodiscus astraera</i>	0.25	
<b>Total number of diatoms counted</b>	416	402

## Lago de Atotonilco

	ATOT/SED
<b>Sample Depth</b>	0.5m
<b>Species</b>	
<i>Anomoeoneis sphaerophora</i> f. <i>sculpta</i>	1.05
<i>Aulacoseira granulata</i> var. <i>valida</i>	0.76
<i>Aulacoseira granulata</i>	29.47
<i>A. granulata</i> var. <i>angustissima</i> f. <i>curvata</i>	0.53
<i>A. granulata</i> var. <i>angustissima</i>	5.26
<i>Aulacoseira</i> sp. 1	5.26
<i>Cyclotella meneghiniana</i>	0.53
<i>Epitheima adnata</i>	1.05
<i>Epithemia hyndmannii</i>	0.53
Large <i>Stephanodiscus</i> fragment	6.86
<i>Stephanodiscus asteroides</i>	0.98
<i>Stephanodiscus asteroides</i> var. <i>intermedia</i>	4.41
<i>Stephanodiscus astraea</i>	0.25
<i>Stephanodiscus astraea</i> var. <i>intermedia</i>	34.8
<i>Stephanodiscus minutulus</i>	3.23
Total diatoms counted	255

## Lago de Cajititlán

	CAJI/SED	CAJI/VEG
Sample Depth	1.5m	1m
Species		
<i>Achnanthes hungarica</i>	-	1.50
<i>Achnanthes minutissima</i>	-	0.50
<i>Amphora montana</i>	0.25	-
<i>Amphora veneta</i>	0.51	1.25
<i>Anomoeoneis costata</i>	0.25	-
<i>Aulacoseira ambigua</i>	2.78	0.25
<i>Aulacoseira distans</i> var. <i>alpigena</i>	6.57	0.50
<i>Aulacoseira granulata</i>	13.89	3.49
<i>Aulacoseira graunlata</i> var. <i>angustissima</i>	35.35	18.45
<i>Cocconeis placentula</i> var. <i>euglypta</i>	0.51	0.25
<i>Cocconeis placentula</i> var. <i>lineata</i>	1.01	16.96
<i>Cyclotella distinguenda</i>	0.51	0.25
<i>Cyclotella meneghiniana</i>	6.82	6.73
<i>Cyclotella ocellata</i>	-	0.25
<i>Cyclotella stelligera</i>	-	0.75
<i>Cymbella cymbiformis</i> f. <i>nonpunctata</i>	-	0.25
<i>Epithemia adnata</i>	-	0.25
<i>Eunotia naegelii</i>	-	0.75
<i>Fragilaria capucina</i> var. <i>mesolepta</i>	3.28	3.99
<i>Gomphonema gracile</i>	-	0.25
<i>Gomphonema parvulum</i>	0.25	1.50
<i>Gomphonema subclavatum</i> var. <i>commutatum</i>	-	0.50
<i>Melosira roseana</i>	0.76	-
<i>Navicula phyllepta</i>	-	0.25
<i>Navicula pupula</i>	0.25	0.25
<i>Navicula pygmaea</i>	0.25	0.25
<i>Navicula radiosa</i>	-	0.25
<i>Nitzschia communis</i>	-	0.25
<i>Nitzschia fonticola</i>	1.25	-
<i>Nitzschia hantzschiana</i>	0.51	-
<i>Nitzschia inconspicua</i>	0.25	0.25
<i>Nitzschia palea</i>	6.98	-
<i>Nitzschia paleacea</i>	-	1.25
<i>Nitzschia perminuta</i>	-	0.25
<i>Nitzschia romana</i>	1.25	-
<i>Nitzschia subacicularis</i>	-	1
<i>Rhopalodia gibba</i>	0.51	1
<i>Rhopalodia gibberula</i> var. <i>van heurckii</i> (fine type)	0.25	2.24
<i>Stauroneis anceps</i>	0.25	-
<i>Stephanodiscus</i> sp. 1	21.97	25.94
<i>Synedra acus</i>	0.25	-
<i>Synedra ulna</i>	1.26	-
Total diatoms counted	394	419

## Lago de Chapala

	CHAP/HYA	CHAP/SED
Sample Depth	1m	1m
Species		
<i>Achnanthes exigua</i>	-	0.33
<i>Achnanthes hungarica</i>	0.25	-
<i>Achnanthes lanceolata</i>	0.25	-
<i>Amphora ovalis</i>	-	1.32
<i>Amphora ovalis</i> var. <i>affine</i>	0.25	-
<i>Amphora pediculus</i>	-	2.64
<i>Amphora perpusilla</i>	3.96	-
<i>Aulacoseira granulata</i> var. <i>valida</i>	-	0.99
<i>Aulacoseira granulata</i>	0.5	-
<i>Aulacoseira granulata</i> var. <i>angustissima</i>	2.76	3.30
<i>Cocconeis placentula</i> var. <i>lineata</i>	-	0.66
<i>Cyclotella ocellata</i>	-	0.33
<i>Epithemia sorex</i>	-	1.65
<i>Epithemia turgida</i>	-	0.33
<i>Fragilaria brevistriata</i>	2.26	0.66
<i>Fragilaria capucina</i> var. <i>mesolepta</i>	27.89	4.95
<i>Fragilaria construens</i>	1.51	0.33
<i>Fragilaria construens</i> var. <i>venter</i>	-	0.33
<i>Fragilaria pinnata</i>	-	0.33
<i>Gomphonema subclavatum</i> var. <i>commutatum</i>	0.75	-
<i>Gomphonema subclavatum</i> var. <i>mexicanum</i>	0.25	0.66
<i>Melosira roseana</i>	5.28	0.99
<i>Navicula capitata</i> var. <i>hungarica</i>	-	20.13
<i>Navicula cincta</i>	2.26	-
<i>Navicula constans</i> var. <i>symmetrica</i>	-	0.33
<i>Navicula laevissima</i>	-	1.32
<i>Navicula mutica</i>	-	0.33
<i>Navicula pupula</i>	-	21.12
<i>Navicula pygmaea</i>	-	0.33
<i>Navicula radiosa</i>	0.25	-
<i>Navicula radiosa</i> var. <i>tenella</i>	5.78	-
<i>Nitzschia fonticola</i>	1.26	-
<i>Nitzschia inconspicua</i>	0.5	-
<i>Nitzschia palea</i>	0.25	-
<i>Nitzschia paleacea</i>	2.01	-
<i>Nitzschia perminuta</i>	-	0.33
<i>Nitzschia romana</i>	0.75	-
<i>Nitzschia sociabilis</i>	0.25	-
<i>Nitzschia sigma</i>	2.01	0.99
<i>Nitzschia tubicola</i>	0.25	-
<i>Opephora martyii</i>	-	0.33
<i>Rhoicosphenia curvata</i>	25.13	6.27
<i>Rhopalodia gibba</i>	0.75	0.33
<i>Rhopalodia gibberula</i> var. <i>van heurckii</i> (coarse)	-	0.99
<i>Rhopalodia gibberula</i> var. <i>van heurckii</i> (fine)	0.5	-
<i>Stephanodiscus</i> sp. 2	19.85	17.82
<i>Stephanodiscus parvus</i>	0.25	-
<i>Surirella bifrons</i>	-	0.33
Total diatoms counted	391	311

## Lago de Cuitzeo

Surface sediment sample uncountable

	CUIT/VEG
Sample depth	0.5m
Species	
<i>Amphora veneta</i>	36.36
<i>Gomphonema sphaerophorum</i>	0.49
<i>Gomphonema subclavatum</i> var. <i>mexicanum</i>	0.25
<i>Navicula radiosa</i> var. <i>tenella</i>	1.47
<i>Nitzschia frustulum</i>	0.49
<i>Nitzschia inconspicua</i>	3.69
<i>Nitzschia palea</i>	13.51
<i>Nitzschia paleacea</i>	1.23
<i>Nitzschia romana</i>	30.47
<i>Nitzschia sigma</i>	1.47
<i>Rhopalodia gibberula</i> var. <i>vanheurckii</i> (coarse type)	2.7
<i>Rhopalodia musculus</i>	7.62
Total diatoms counted	400

## Laguna de Juanacatlán

	J/AE/ 97	J/AE/ 98	J/AW/ 97	J/ BVEG	J/ REED	JUAN/ SED1	JUAN/ SED2
Sample Depth	0.2m	0.3m	0.5m	1m	1m	7m	3m
Species							
<i>Achnanthes exigua</i>	-	-	0.48	-	-	0.24	-
<i>Achnanthes lanceolata</i>	2.98	-	-	-	-	-	10.94
<i>A. lanceolata</i> var. <i>rostrata</i>	-	-	-	0.77	-	1.45	0.25
<i>Achnanthes minutissima</i>	1.24	-	9.29	1.29	12.09	-	0.76
<i>Aulacoseira granulata</i>	-	-	0.24	-	-	-	-
<i>A. granulata</i> var. <i>angustissima</i>	0.99	-	0.48	0.52	-	-	-
<i>A. italica</i> var. <i>tenuissima</i>	-	-	-	-	-	0.72	-
<i>Brachysira neoxilis</i>	-	-	-	-	0.27	-	-
<i>Cocconeis placentula</i> var. <i>euglypta</i>	0.99	-	-	-	0.27	-	1.53
<i>C. placentula</i> var. <i>lineata</i>	21.84	0.54	1.67	4.64	50.82	-	6.11
<i>Cyclotella meneghiniana</i>	0.99	-	-	-	-	-	-
<i>Cyclotella ocellata</i>	-	-	-	-	0.82	-	-
<i>Cyclotella stelligera</i>	0.5	0.18	1.19	1.8	0.55	0.48	-
<i>Cymbella microcephala</i>	0.5	-	-	0.77	0.27	-	-
<i>Cymbella minuta</i> var. <i>silesiaca</i>	-	-	-	-	-	-	0.76
<i>Diploneis elliptica</i>	-	-	-	-	-	-	0.25
<i>Epithemia adnata</i>	-	-	-	0.52	-	-	-
<i>Epithemia sorex</i>	-	-	-	-	-	0.24	-
<i>Fragilaria brevistriata</i>	-	-	0.24	0.26	-	-	-
<i>Fragilaria construens</i>	0.25	-	2.14	-	-	2.65	-
<i>F. construens</i> var. <i>venter</i>	-	-	-	-	0.55	-	-
<i>Fragilaria crotonensis</i>	20.84	98.91	72.14	75.26	9.62	78.07	62.34
<i>Fragilaria pinnata</i>	-	-	2.14	1.55	-	14.46	-
<i>F. pinnata</i> var. <i>lancettula</i>	-	-	0.71	0.26	-	0.96	-
<i>Fragilaria vaucheriae</i>	-	-	-	-	0.55	-	-
<i>Frustulia rhomboides</i>	-	-	-	0.26	-	-	-
<i>Frustulia vulgaris</i>	-	-	-	-	-	-	0.25
<i>Gomphonema affine</i>	-	-	0.24	-	-	0.24	-
<i>Gomphonema intricatum</i>	0.5	-	-	-	-	-	-
<i>G. intricatum</i> var. <i>pusilla</i>	-	-	-	0.52	-	-	0.25
<i>Gomphonema parvulum</i>	2.73	-	0.95	1.29	0.27	-	0.76
<i>Gyrosigma obtusatum</i>	-	-	-	-	-	-	0.25
<i>Navicula cryptcephala</i>	2.23	-	-	0.26	5.49	-	0.25
<i>Navicula cuspidata</i>	-	-	-	-	-	-	0.51
<i>Navicula laevis</i>	0.25	-	-	-	-	-	-
<i>Navicula menisculus</i>	-	-	-	0.26	-	-	-
<i>Navicula miniscula</i>	-	-	-	-	-	-	0.51
<i>Navicula pupula</i>	-	-	0.24	0.26	-	-	1.27
<i>Navicula radiosa</i>	-	-	-	1.29	-	-	0.51
<i>Navicula salinarium</i> var. <i>intermedia</i>	0.74	-	-	-	-	-	0.51
<i>Navicula subrotundata</i>	0.25	-	-	-	2.32	-	-
<i>Navicula symmetrica</i>	-	-	-	-	-	-	0.25
<i>N. viridula</i> var. <i>linearis</i>	-	0.18	-	-	-	-	-
<i>Nitzschia amphibia</i>	-	-	-	-	-	0.48	-
<i>Nitzschia linearis</i>	1.74	-	0.24	-	-	-	0.51
<i>Nitzschia palea</i>	19.35	-	0.24	1.29	6.87	-	3.05
<i>Nitzschia paleacea</i>	-	-	-	-	4.95	-	-
<i>Nitzschia sigma</i>	-	-	-	-	-	-	0.25
<i>Pinnularia abaujensis</i> var. <i>linearis</i>	-	-	-	-	0.27	-	-

<i>Pinnularia maior</i>	-	-	-	0.26	-	-	-
<i>Pinnularia microstauron</i>	1.24	-	-	1.03	-	-	0.76
<i>Pinnularia subcapitata</i>	-	-	-	-	-	-	1.53
<i>Rhoicosphenia curvata</i>	-	-	-	0.77	-	-	3.05
<i>Rhopalodia operculata</i>	-	-	-	-	-	-	0.25
<i>Synedra acus</i>	-	-	-	0.52	0.55	-	-
<i>Synedra nana</i>	3.72	-	5.71	-	3.30	-	-
<i>Synedra radians</i>	-	-	-	-	2.47	-	-
<i>Synedra fasciculata</i>	0.25	-	-	-	-	-	-
<i>Synedra ulna</i>	-	-	-	-	-	-	-
Total Diatoms Counted	407	553	446	410	365	419	409

## Lagunilla de San Gregorio

	LAGUNILLA
Sample Depth	1m
Species	
<i>Achnanthes lanceolata</i> var. <i>dubia</i>	0.53
<i>Brachysira vitrea</i>	0.27
<i>Cymbella amphicephala</i>	1.34
<i>Cymbella minuta</i> var. <i>silesica</i>	0.76
<i>Eunotia pectinalis</i> var. <i>minor</i>	4.28
<i>Eunotia incisa</i>	3.48
<i>Eunotia naegeli</i>	17.38
<i>Eunotia eruca</i>	0.8
<i>Frustulia rhomboides</i> var. <i>crassinervia</i>	11.50
<i>Gomphonema clevei</i>	1.07
<i>Gomphonema gracile</i>	4.28
<i>Gomphonema parvulum</i>	4.28
<i>Navicula laevissima</i>	3.21
<i>Navicula mutica</i>	1.87
<i>Navicula pupula</i>	0.8
<i>Navicula radiosa</i>	4.01
<i>N. radiosa</i> var. <i>tenella</i>	0.27
<i>Navicula seminulum</i>	1.6
<i>Nitzschia palea</i>	0.53
<i>Nitzschia paleacea</i>	2.67
<i>Pinnularia abaujensis</i> var. <i>linearis</i>	8.56
<i>Pinnularia borealis</i>	1.07
<i>Pinnularia gibba</i>	1.34
<i>Pinnularia maior</i>	0.53
<i>Pinnularia</i> cf. <i>microstauron</i>	17.38
<i>Pinnularia subcapitata</i>	2.94
<i>Pinnularia viridis</i>	1.34
<i>Stauroneis phoenicentron</i>	0.53
<i>Stauroneis anceps</i>	0.27
<i>Stenopterobia</i> spp.	1.34
Total Diatoms Counted	378

## Lago de Yuriria

	LY/MACR	LYUR/SED
Sample Depth	1m	1m
Species		
<i>Achnanthes lanceolata</i>	0.26	1.08
<i>Amphora commutata</i>	-	0.54
<i>Amphora veneta</i>	2.63	4.32
<i>Aulacoseira distans</i> var. <i>alpigena</i>	-	1.62
<i>Aulacoseira granulata</i>	-	8.65
<i>A. granulata</i> var. <i>angustissima</i>	-	10.81
<i>Cocconeis placentula</i> var. <i>lineata</i>	-	10.27
<i>Cyclotella meneghiniana</i>	4.74	1.62
<i>Cyclotella ocellata</i>	0.26	-
<i>Cyclotella stelligera</i>	-	0.54
<i>Cymbella mexicana</i>	-	0.54
<i>Cymbella microcephala</i>	-	0.54
<i>Epithemia turgida</i>	-	4.86
<i>Gomphonema acuminatum</i>	0.53	-
<i>Gomphonema affine</i>	0.26	-
<i>Gomphonema gracile</i>	0.53	-
<i>Gomphonema parvulum</i>	0.53	-
<i>Gomphonema subclavatum</i> var. <i>mexicanum</i>	-	1.62
<i>Melosira roseana</i>	2.7	-
<i>Navicula cincta</i>	-	0.54
<i>Navicula cuspidata</i>	-	0.54
<i>Navicula laevissima</i>	-	4.32
<i>Navicula phyllepta</i>	-	0.54
<i>Navicula pupula</i>	-	2.16
<i>Navicula radiosa</i> var. <i>tenella</i>	-	0.54
<i>Nitzschia amphibia</i>	8.11	1.26
<i>Nitzschia communis</i>	0.54	-
<i>Nitzschia frustulum</i>	-	1.26
<i>Nitzschia palea</i>	31.05	-
<i>Nitzschia paleacea</i>	22.11	-
<i>Nitzschia romana</i>	30	0.54
<i>Pinnularia maior</i>	-	1.08
<i>Rhoicosphenia curvata</i>	-	1.08
<i>Rhopalodia gibba</i>	0.26	10.81
<i>R. gibberula</i> var. <i>vanheurckii</i> (coarse)	-	5.41
<i>R. gibberula</i> var. <i>vanheurckii</i> (fine)	3.42	2.70
<i>Rhopalodia gibberula</i>	-	7.03
<i>Synedra fasciculata</i>	-	0.54
<i>Synedra ulna</i>	0.26	3.24
Total diatoms counted	381	221

## Lago de Pátzcuaro

	PATZ/SED	PATZ/VEG
Sample Depth	1.5m	1.5m
Species		
<i>Achnanthes minutissima</i>	0.25	0.75
<i>Amphora ovalis</i>	2.51	-
<i>Amphora ovalis</i> var. <i>affine</i>	2.76	-
<i>Amphora veneta</i>	-	0.5
<i>Anomoeoneis sphaerophora</i>	0.25	-
<i>Aulacoseira granulata</i> var. <i>valida</i>	0.25	-
<i>Aulacoseira granulata</i>	23.37	1.51
<i>Aulacoseira granulata</i> var. <i>angustissima</i>	-	1.01
<i>Cocconeis placentula</i> var. <i>euglypta</i>	0.5	-
<i>Cocconeis placentula</i> var. <i>lineata</i>	16.08	-
<i>Cyclotella distinguenda</i>	0.5	-
<i>Cyclotella menghiniana</i>	0.75	-
<i>Cyclotella ocellata</i>	2.51	-
<i>Cyclotella stelligera</i>	1.01	0.50
<i>Cymatopleura solea</i>	0.25	-
<i>Cymbella aequalis</i>	0.25	-
<i>Cymbella cymbiformis</i> f. <i>nonpunctata</i>	0.25	0.50
<i>Cymbella mexicana</i>	0.25	-
<i>Cymbella tumidula</i>	-	0.75
<i>Epithemia adnata</i>	7.04	0.25
<i>Epithemia argus</i>	1.01	-
<i>Epithemia sorex</i>	9.30	0.25
<i>Fragilaria brevistriata</i>	0.25	-
<i>Fragilaria capucina</i> var. <i>mesolepta</i>	2.01	0.25
<i>Gomphonema gracile</i>	0.50	-
<i>Gomphonema grunowii</i>	-	4.02
<i>Gomphonema</i> sp.	-	10.55
<i>Gomphonema intricatum</i> var. <i>pusilla</i>	0.50	1.26
<i>Gomphonema parvulum</i>	0.50	-
<i>Gomphonema subclavatum</i> var. <i>mexicanum</i>	0.75	0.25
<i>Hantzschia amphioxys</i>	0.25	-
<i>Navicula capitata</i> var. <i>hungarica</i>	-	0.5
<i>Navicula cuspidata</i>	0.25	-
<i>Navicula phyllepta</i>	1.51	-
<i>Navicula radiosa</i>	0.75	0.25
<i>Navicula radiosa</i> var. <i>tenella</i>	-	4.27
<i>Navicula trivialis</i>	1.01	-
<i>Nitzschia amphibia</i>	-	3.61
<i>Nitzschia denticula</i> var. <i>delongi</i>	0.25	-
<i>Nitzschia fonticola</i>	0.5	-
<i>Nitzschia gracilis</i>	-	1.55
<i>Nitzschia inconspicua</i>	0.5	-
<i>Nitzschia linearis</i>	0.75	0.5
<i>Nitzschia palea</i>	-	2.51
<i>Nitzschia paleacea</i>	-	58.54
<i>Nitzschia perminuta</i>	1.01	-
<i>Nitzschia romana</i>	-	4.52
<i>Rhoicosphenia curvata</i>	3.77	-
<i>Rhopalodia gibba</i>	3.52	-
<i>Stephanodiscus minutulus</i>	1.01	-
<i>Surirella tenera</i>	0.25	-
<i>Synedra goulardii</i>	5.28	6.78
<i>Synedra fasciculata</i>	0.5	-
<i>Synedra ulna</i>	0.25	-
Total Diatoms Counted	408	404

## Laguna Potrerillo

	POT/FLO	POT/SED
Sample Depth	0.8m	0.8m
Species		
<i>Achnanthes hungarica</i>	-	0.29
<i>Achnanthes minutissima</i>	-	0.86
<i>Aulacoseira ambigua</i>	-	2.87
<i>Aulacoseira distans</i>	0.29	-
<i>Aulacoseira granulata</i>	23.27	1.51
<i>Aulacoseira granualata</i> var. <i>angustissima</i>	1.01	-
<i>Aulacoseira</i> sp 2	-	9.74
<i>Cyclotella meneghiniana</i>	1.29	2.29
<i>Cyclotella ocellata</i>	0.29	-
<i>Cyclotella stelligera</i>	1.80	15.76
<i>Cymbella minuta</i>	-	0.29
<i>Eunotia naegelii</i>	-	0.86
<i>Fragilaria capucina</i>	5.93	-
<i>Gomphonema affine</i>	0.26	-
<i>Gomphonema augur</i> var. <i>turris</i>	-	0.57
<i>Gomphonema gracile</i>	0.26	0.57
<i>Gomphonema parvulum</i>	0.77	0.57
<i>Navicula confervacea</i>	20.88	5.73
<i>Navicula cryptocephala</i>	0.26	0.29
<i>Navicula laevisissima</i>	0.52	0.29
<i>Navicula modica</i>	1.55	-
<i>Navicula mutica</i>	-	0.86
<i>Navicula pupula</i>	0.26	0.57
<i>Navicula radiosa</i> var. <i>tenella</i>	1.03	1.43
<i>Navicula seminulum</i>	4.90	-
<i>Nitzschia acidoclinata</i>	-	1.53
<i>Nitzschia amphibia</i>	-	0.51
<i>Nitzschia communis</i>	-	1.28
<i>Nitzschia fonticola</i>	-	0.26
<i>Nitzschia frustulum</i>	-	0.26
<i>Nitzschia palea</i>	10.82	0.29
<i>Nitzschia paleacea</i>	3.09	0.29
<i>Pinnularia microstauron</i>	-	0.29
<i>Pinnularia subcapitata</i>	-	0.86
<i>Rhopalodia gibba</i>	-	0.29
<i>Stephanodiscus</i> fragment	-	5.16
<i>Stephanodiscus minutulus</i>	2.87	-
<i>Synedra acus</i>	1.03	0.29
<i>Synedra ulna</i>	0.52	-
Total diatoms counted	399	376

## La Preciosa

	PREC/ REED	PREC/ SED1	PREC/ SED2
Sample Depth	0.5m	3m	0.5m
Species			
<i>Achnanthes exigua</i>	-	0.28	-
<i>Achnanthes grana</i>		3.95	1.33
<i>Achnanthes minutissima</i>	2.30	3.39	1.07
<i>Amphora montana</i>	-	0.28	-
<i>Amphora ovalis</i>	-	1.98	-
<i>Amphora ovalis</i> var. <i>affine</i>	-	2.82	-
<i>Amphora pediculus</i>	5.10	2.74	7.73
<i>Amphora perpusilla</i>	0.26	10.17	3.73
<i>Amphora veneta</i>	-	1.98	3.47
<i>Brachysira vitrea</i>	0.26	-	-
<i>Brachysira zellensis</i>	-	1.13	0.80
<i>Cocconeis pediculus</i>	0.77	-	0.27
<i>Cocconeis diminuta</i>	6.89	8.10	10.40
<i>Cocconeis placentula</i> var. <i>euglypta</i>	-	0.56	5.77
<i>Cocconeis placentula</i> var. <i>lineata</i>	10.20	5.37	15.20
<i>Cyclotella meneghiniana</i>	11.48	2.82	2.67
<i>Cyclotella ocellata</i>	-	0.28	-
<i>Cyclotella stelligera</i>	-	0.28	-
<i>Cymbella aspera</i>	-	0.85	-
<i>Cymbella cymbiformis</i> f. <i>nonpunctata</i>	-	1.13	2.67
<i>Cymbella mexicana</i>	0.51	-	1.07
<i>Cymbella microcephala</i>	-	0.56	-
<i>Cymbella minuta</i> var. <i>silesiaca</i>	0.77	-	-
<i>Cymbella pusilla</i>	0.26	-	-
<i>Diploneis puella</i>	-	0.28	0.27
<i>Entomoneis alata</i>	-	0.56	0.53
<i>Epithemia adnata</i>	2.04	0.28	1.60
<i>Epithemia argus</i>	6.38	3.39	6.40
<i>Epithemia hyndmannii</i>	-	0.28	5.87
<i>Epithemia sorex</i>	1.53	-	0.27
<i>Epithemia turgida</i>	1.79	-	-
<i>Fragilaria</i> var. <i>brevistriata</i>	1.02	3.39	0.80
<i>Fragilaria construens</i>	0.51	2.82	-
<i>Fragilaria construens</i> var. <i>venter</i>	3.06	-	-
<i>Fragilaria pinnata</i>	0.77	-	-
<i>Fragilaria pinnata</i> var. <i>lancettula</i>	-	1.98	0.80
<i>Fragilaria vaucheriae</i>	-	0.85	0.27
<i>Fragilaria vaucheriae</i> var. <i>capitellata</i>	2.30	1.13	-
<i>Gomphonema intricatum</i>	-	-	0.80
<i>Gomphonema intricatum</i> var. <i>pusilla</i>	0.77	-	0.53
<i>Gomphonema olivaceum</i>	3.57	2.82	4.27
<i>Gomphonema parvulum</i>	0.51	0.85	0.27
<i>Gomphonema subclavatum</i> var. <i>mexicanum</i>	-	-	0.53
<i>Mastogloia elliptica</i>	-	-	0.27

<i>Mastogloia elliptica</i> var. <i>dansei</i>	-	0.28	-
<i>Mastogloia smithii</i>	1.53	-	0.80
<i>Mastogloia smithii</i> var. <i>lacustris</i>	-	-	0.53
<i>Navicula capitata</i>	-	-	2.13
<i>Navicula capitata</i> var. <i>hungarica</i>	-	0.28	-
<i>Navicula cuspidata</i>	-	-	0.27
<i>Navicula halophila</i>	-	0.56	-
<i>Navicula laevis</i>	0.26	1.13	-
<i>Navicula menisculus</i>	-	-	1.33
<i>Navicula mutica</i>	-	0.28	0.27
<i>Navicula oblonga</i>	0.51	-	-
<i>Navicula pupula</i>	-	0.28	-
<i>Navicula radiosa</i> var. <i>tenella</i>	1.28	7.06	4.80
<i>Navicula tenelloides</i>	1.53	-	-
<i>Nitzschia amphibia</i>	1.13	2.93	-
<i>Nitzschia communis</i>	1.69	0.27	-
<i>Nitzschia frustulum</i>	0.85	-	0.23
<i>Nitzschia hantschiana</i>	0.28	-	-
<i>Nitzschia inconspicua</i>	1.28	-	-
<i>Nitzschia linearis</i>	-	-	0.53
<i>Nitzschia microcephala</i>	2.04	5.08	0.27
<i>Nitzschia palea</i>	-	0.85	0.80
<i>Nitzschia paleacea</i>	0.51	-	1.33
<i>Nitzschia romana</i>	-	8.47	0.53
<i>Pinnularia viridis</i>	-	-	0.27
<i>Rhoicosphenia curvata</i>	2.30	-	2.93
<i>Rhopalodia acuminata</i>	0.51	-	-
<i>Rhopalodia gibba</i>	-	-	0.27
<i>Rhopalodia gibberula</i> var. <i>van heurckii</i> ( <i>fine</i> )	13.78	-	0.27
<i>Rhopalodia gibberula</i> var. <i>protracta</i>	-	1.69	-
<i>Rhopalodia operculata</i>	-	2.26	-
<i>Synedra rumpens</i>	-	0.28	-
<i>Synedra ulna</i>	5.36	0.28	-
<i>S. ulna</i> var. <i>oxyrhyncus</i> f. <i>mediocontracta</i>	1.28	-	0.27
Total diatoms counted	400	373	386

**La Piscina de Yuriria**

	PYUR/SED
Sample Depth	0.3m
Species	
<i>Amphora ovalis</i> var. <i>affine</i>	0.47
<i>Anomoeoneis costata</i>	8.18
<i>Anomoeoneis sphaerophora</i>	47.90
<i>A. sphaerophora</i> f. <i>sculpta</i>	1.64
<i>Chaetoceros muelleri</i> (spore)	7.71
<i>Cyclotella meneghiniana</i>	1.40
<i>Denticula elegans</i>	1.64
<i>Navicula elkab</i>	15.65
<i>Navicula detenta</i>	0.26
<i>Navicula halophila</i>	3.27
<i>Navicula heufleri</i> var. <i>leptocephala</i>	0.23
<i>Nitzschia palea</i>	3.04
<i>Nitzschia paleacea</i>	0.23
<i>Nitzschia perspicua</i>	1.40
<i>Nitzschia romana</i>	1.17
<i>Rhopalodia gibberula</i> var. <i>vanheurckii</i> (coarse)	4.67
<i>Rhopalodia gibberula</i> var. <i>vanheurckii</i> (fine)	0.23
Total diatoms counted	415

## Laguna Quechulac

	QUEC/ BVEG	QUEC/ REED	QUEC/ SED
Sample Depth	1m	1m	23m
Species			
<i>Achnanthes linearis</i>	-	-	3.43
<i>Achnanthes minutissima</i>	76.26	80.10	40.11
<i>Amphora ovalis</i> var. <i>affine</i>	-	-	0.26
<i>Amphora perpusilla</i>	-	-	0.53
<i>Amphora veneta</i>	0.24	-	0.53
<i>Aulacoseira granulata</i> var. <i>angustissima</i>	1.92	0.48	-
<i>Aulacoseira italica</i>	-	-	0.26
<i>Cocconeis pediculus</i>	0.72	-	8.71
<i>Cocconeis placentula</i> var. <i>lineata</i>	0.96	-	3.17
<i>Cyclotella menghiniana</i>	-	-	0.26
<i>Cymbella affinis</i>	0.24	10.31	-
<i>Cymbella microcephala</i>	0.48	0.24	0.26
<i>Epithemia sorex</i>	-	-	0.53
<i>Fragilaria brevistriata</i>	0.24	-	-
<i>Fragilaria contruens</i>	-	-	0.26
<i>Fragilaria construens</i> var. <i>venter</i>	-	-	1.58
<i>Fragilaria crotonensis</i>	0.72	-	3.69
<i>Fragilaria pinnata</i> var. <i>lancettula</i>	-	-	0.26
<i>Fragilaria vaucheriae</i> var. <i>capitellata</i>	0.24	-	0.26
<i>Gomphonema gracile</i>	-	-	1.06
<i>Gomphonema intricatum</i>	-	1.20	-
<i>Gomphonema olivaceum</i>	0.24	-	-
<i>Gomphonema parvulum</i>	4.80	3.36	16.89
<i>Navicula capitata</i>	-	-	1.58
<i>Navicula cryptocephala</i>	-	-	0.79
<i>Nitzschia microcephala</i>	-	-	1.06
<i>Nitzschia paleacea</i>	1.20	0.48	-
<i>Nitzschia romana</i>	-	-	1.06
<i>Synedra acus</i>	10.07	3.12	1.85
<i>Synedra radians</i>	-	-	6.60
Total Diatoms Counted	417	417	404

## River Samples

	RDA/STO	RDP/STO
Sample Depth	0.1m	0.2m
Species		
<i>Achnanthes lanceolata</i>	45.11	39.33
<i>Achnanthes lanceolata</i> var. <i>dubia</i>	0.27	-
<i>Achnanthes lanceolata</i> var. <i>rostrata</i>	-	1.03
<i>Achnanthes minutissima</i>	-	1.54
<i>Amphora montana</i>	2.17	-
<i>Amphora perpusilla</i>	0.27	-
<i>Cocconeis placentula</i> var. <i>euglypta</i>	-	1.29
<i>Cocconeis placentula</i> var. <i>lineata</i>	-	4.11
<i>Cymbella sinuata</i>	-	41.13
<i>Eunotia</i> sp.	1.63	-
<i>Gomphonema clevei</i>	0.27	5.91
<i>Gomphonema parvulum</i>	0.82	0.77
<i>Navicula confervacea</i>	1.63	-
<i>Navicula cryptocephala</i>	2.72	-
<i>Navicula mutica</i>	1.09	-
<i>Navicula seminulum</i>	42.12	-
<i>Navicula subrotundata</i>	-	4.63
<i>Nitzschia fonticola</i>	-	1.58
<i>Nitzschia romana</i>	1.09	-
Total Diatoms Counted	368	389

## La Yerbabuena

	YER/SED	YER/VEG
Sample Depth	0.5m	0.5m
Species		
<i>Achnanthes exigua</i>	2.93	6.12
<i>Achnanthes lanceolata</i> var. <i>dubia</i>	0.68	-
<i>Achnanthes lanceolata</i> var. <i>rostrata</i>	-	0.27
<i>Achnanthes minutissima</i>	0.23	0.53
<i>Amphora montana</i>	-	1.06
<i>Amphora veneta</i>	1.13	0.27
<i>Cyclotella stelligera</i>	0.45	0.27
<i>Cymbella mexicana</i>	0.45	0.27
<i>Epithemia sorex</i>	-	0.53
<i>Fragilaria brevistriata</i>	6.31	-
<i>Fragilaria construens</i>	1.13	1.60
<i>Fragilaria construens</i> var. <i>venter</i>	1.58	2.13
<i>Fragilaria lapponica</i>	-	1.33
<i>Fragilaria pinnata</i> var. <i>lancettula</i>	72.07	50.53
<i>Gomphonema acuminatum</i>	0.68	-
<i>Navicula confervacea</i>	0.45	1.33
<i>Navicula pupula</i>	0.68	0.27
<i>Navicula radiosa</i> var. <i>tenella</i>	0.45	0.27
<i>Navicula subrotundata</i>	-	4.26
<i>Nitzschia fonticola</i>	1.58	21.81
<i>Nitzschia palea</i>	0.68	1.60
<i>Nitzschia plaeacea</i>	0.90	1.06
<i>Rhopalodia gibberula</i> var. <i>vanheurckii</i>	1.80	-
Total diatoms counted	444	376

## Lago de Zirahuén

Samples obtained by the Universidad Michoacana de San Nicolás de Hidalgo

	ZIR/ 30B	ZIR/ 35A	ZIR/ 35B	ZIR/ 59A	ZIR/ 8A	ZIR/ 8B
Sample Depth	37m	26m	26m	11.5 m	25m	26m
Species						
<i>Achnanthes lanceolata</i>	-	-	-	-	-	0.48
<i>A. lanceolata</i> var. <i>rostrata</i>	-	-	-	0.23	-	-
<i>Amphora ovalis</i>	-	-	-	0.92	-	-
<i>Aulacoseira ambigua</i>	1.45	0.97	-	0.92	-	0.24
<i>Aulacoseira distans</i> var. <i>alpigena</i>	0.96	3.86	7.28	-	2.27	6.41
<i>Brachysira neoexilis</i>	1.45	-	0.73	0.23	0.76	0.71
<i>Cymbella cymbiformis</i>	0.48	0.48	0.24	0.69	0.76	0.48
<i>Cymbella microcephala</i>	0.24	-	0.49	0.69	-	-
<i>Cyclotella ocellata</i>	61.4 5	57	70.3 9	23.2 2	75.8 2	63.4 2
<i>Cyclotella stelligera</i>	27.7 1	30.9 2	17.2 3	29.2 0	16.6 2	22.0 9
<i>Diploneis elliptica</i>	1.20	1.93	0.73	7.59	0.5	1.43
<i>Fragilaria brevistriata</i>	0.96	0.24	0.24	9.20	0.50	0.24
<i>Fragilaria construens</i>	0.24	0.97	-	0.46	-	0.48
<i>Fragilaria construens</i> var. <i>venter</i>	0.24	2.17	-	2.76	0.25	0.24
<i>Fragilaria crotonensis</i>	-	-	0.73	-	1.76	1.19
<i>Fragilaria pinnata</i>	0.24	-	0.24	4.60	-	0.24
<i>Fragilaria pinnata</i> var. <i>lancettula</i>	0.48	-	-	1.84	-	-
<i>Gomphonema intricatum</i> var. <i>pusilla</i>	0.24	-	-	1.38	-	0.71
<i>Gomphonema subtile</i> var. <i>sagitte</i>	-	0.24	-	-	0.24	-
<i>Navicula cymbula</i>	0.24	-	0.49	0.92	-	0.24
<i>Navicula viridula</i> var. <i>linearis</i>	-	0.24	0.24	1.38	-	0.24
<i>Nitzschia amphibia</i>	-	-	-	3.22	-	-
<i>N. amphibia</i> f. <i>rostrata</i>	-	-	-	1.15	-	-
Total diatoms counted	415	414	412	435	397	421

## Lago de Zirahuén

Samples obtained from Agua Verde in 1997.

Species	AV/B VEG1	AV/B VEG2	AV/B VEG3	ZIR/ SED1	ZIR/ SED2
Sample Depth	1m	1m	1m	1m	3m
Species					
<i>Achnanthes exigua</i>	-	0.46	0.23	-	0.24
<i>A. lanceolata</i> var. <i>rostrata</i>	1.90	1.37	1.64	3.56	0.48
<i>Achnanthes minutissima</i>	0.27	0.46	2.34	0.24	2.66
<i>Amphora ovalis</i> var. <i>affine</i>	0.27	-	0.23	-	-
<i>Amphora pediculus</i>	0.54	-	0.23	1.43	-
<i>Aulacoseira ambigua</i>	0.54	0.68	-	-	0.48
<i>Aulacoseira distans</i> var. <i>alpigena</i>	-	0	0.23	-	0.97
<i>Brachysira neoexilis</i>	3.52	29.68	4.45	1.90	2.17
<i>Cocconeis placentula</i> var. <i>euglypta</i>	-	-	-	-	0.72
<i>Cocconeis placentula</i> var. <i>lineata</i>	0.27	-	0.23	0.24	1.69
<i>Cyclotella ocellata</i>	25.75	16.67	46.37	47.27	59.18
<i>Cyclotella stelligera</i>	1.36	0.23	0.70	0.71	2.90
<i>Cymbella cymbiformis</i>	1.90	0.23	0.47	1.43	2.42
<i>Cymbella microcephala</i>	13.82	24.66	13.58	2.85	5.86
<i>Diploneis elliptica</i>	0.81	0.46	0.23	0.24	0.48
<i>Epithemia sorex</i>	1.36	1.14	0.23	0.48	1.93
<i>Fragilaria brevistriata</i>	1.90	0.46	0.47	0.24	1.45
<i>Fragilaria construens</i>	1.36	0.68	0.23	5.94	0.24
<i>Fragilaria construens</i> var. <i>venter</i>	2.44	0.23	-	-	1.21
<i>Fragilaria crotonensis</i>	-	2.81	-	-	-
<i>Fragilaria pinnata</i>	6.78	2.97	4.22	6.89	0.72
<i>Fragilaria pinnata</i> var. <i>lancettula</i>	0.81	1.83	0.23	5.23	0.24
<i>Fragilaria vaucheriae</i>	11.11	2.51	0.70	2.85	0.72
<i>Gomphonema intricatum</i> var. <i>pusilla</i>	2.71	1.60	1.17	0.24	1.93
<i>Gomphonema subtile</i> var. <i>sagitte</i>	-	0.46	-	-	0.24
<i>Navicula cymbula</i>	0.81	-	0.47	0.48	0.48
<i>Navicula subrotundata</i>	0.27	5.25	2.34	-	-
<i>Navicula viridula</i> var. <i>linearis</i>	-	0.23	-	0.24	0.24
<i>Nitzschia amphibia</i>	-	0.23	-	-	-
<i>N. amphibia</i> f. <i>rostrata</i>	0.54	-	0.23	-	-
<i>Nitzschia valdestriata</i>	4.61	0.68	5.62	6.89	0.24
<i>Rhopalodia gibba</i>	-	1.37	0.23	0.24	0.97
<i>Synedra radians</i>	-	-	-	-	1.93
Total Diatoms Counted	369	438	427	444	420

## Appendix 5

### Full TWINSpan classification of Central Mexican diatom samples and species.

ORDER OF SAMPLES

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28 PYUR/SED ] 1 ALC/REEF ] 2 ALCH/SED ] 10 CUIT/VEG ] 8 CHAP/HYA ] 19
LY/MACR ] 22 PATZ/VEG ] 6 CAJI/SED
7 CAJI/VEG ] 20 LYUR/SED ] 21 PATZ/SED ] 9 CHAP/SED ] 25 PRE/REED ] 26
PRE/SED1 ] 27 PRE/SED2 ] 34 YER/SED
35 YER/VEG ] 32 RDA/STO ] 33 RDP/STO ] 11 J/AE/97 ] 13 J/AW/97 ] 14
J/BVEG ] 17 JUA/SED2 ] 15 J/REED
29 QUEC/VEG ] 30 QUEC/REE ] 31 QUEC/SED ] 18 LAGUNILL ] 23 POT/FLO ] 24
POTR/SED ] 42 ZIR/SED1 ] 3 AV/BVEG1
4 AV/BVEG2 ] 5 AV/BVEG3 ] 43 ZIR/SED2 ] 39 ZIR/59A ] 36 ZIR/30B ] 37
ZIR/35A ] 38 ZIR/35B ] 40 ZIR/8A
41 ZIR/8B ] 12 J/AE/98 ] 16 JUA/SED1 ]

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1

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2 1 12 22 2223333111112331224 433334411
8120892670195674523134759018342345396780126

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15	AM 001D	1---1---1-2--2-----1---1-1-1-----	00000
158	NI 014A	----1---31-112-----2---1-2-----1	00000
191	RH 001A	----11-11421--111-----11-111---1---	00000
16	AM 012A	-12-----2323-----11-1-----	00001
148	NA 003B	-1513-2--1--13211-----1111111111-----	00001
3	AC 158A	-----21-----	000100
12	AM 007A	-----1-----	000100
33	BR 005A	-----11-----	000100
39	CO 006A	-----3-----	000100
42	CO 009A	-----34--1-----	000100
44	CY 028A	-----11-1-----	000100
49	CL 001A	-----1-----	000100
50	CM 014A	-----1-----	000100
53	CM 005A	-----1-----	000100
55	CM 007B	-----1-1-1--12-----	000100
62	C YTUM	-----1-----	000100
68	DP 006A	-----11-----	000100
70	EN 003A	-----11-----	000100
71	EP 007A	-----1-1-3-211-----1-----	000100
73	EP 007F	-----1-----	000100
75	EP 005A	-----13-----	000100
78	EP 004C	-----1--11-----	000100
87	FR 009B	-----5-122-22-----	000100
104	GO 026A	-----2-----	000100
105	GO PATZ	-----4-----	000100
108	GO 001A	-----222-----1-----	000100
111	GO 011B	-----1--1-----	000100
112	GO 011C	-----11-1--111--1-----	000100
115	HA 001A	-----1-----	000100
117	MA 002B	-----1-----	000100
119	MA 001B	-----1-----	000100
120	ME 039A	-----1-2-3-----	000100
123	NA 021A	1---2---1-----	000100
125	NA 171A	-----1-----	000100
141	NA 024A	-----1-----	000100
144	NA 058A	-----111-----	000100
146	NA 010A	-----11--1-----	000100
153	NA 675A	-----1-----	000100
154	NA 063A	-----1-----	000100
157	NI 030A	-----1-----	000100
160	NI 010A	--1-----11--111-----	000100
166	NI 034A	-----1-----1-----	000100
172	NI 005A	-----1--11-----	000100
177	NI 171A	-----1-----	000100
178	NI TUBI	-----1-----	000100
190	RH 010A	-----1-----	000100
193	RH0 03FI	1---12-123--4-11-----	000100
194	RH 003B	-----1-----	000100
200	ST CAJI	-----45-----	000100
201	ST CHAP	-----4-----4-----	000100

205	ST 010A	----	1	-----	-----	000100												
206	SU 070A	-----	1	-----	-----	000100												
210	SY 014A	-----	3	---	3	-----	000100											
219	SY 001D	-----	1	---	1	-----	000100											
1	AC 016A	--	1	-----	-----	000101												
11	AM 006A	-12	-----	-----	-----	000101												
19	AN 005A	3-1	---	1	-----	000101												
20	AN 009A	5	-----	1	-----	000101												
21	AN 009B	1	-----	-----	-----	000101												
22	ME 003D	--	1	---	11	-----	000101											
36	CH 057A	3	-----	-----	-----	000101												
37	CO 009A	--	1	-----	-----	000101												
43	CY 012A	-32	-----	-----	-----	000101												
47	CY 017A	-22	-----	-----	-----	000101												
61	CM 023A	-51	-----	1	-----	000101												
63	DE 002A	1	-----	-----	-----	000101												
65	DP 007A	-2	-----	-----	-----	000101												
69	DP 005A	-11	-----	-----	-----	000101												
74	EP 003A	-41	-----	1	---	323	-----	000101										
110	GO 012A	---	1	-----	-----	000101												
116	MA 002C	-21	-----	1	---	1	-----	000101										
118	MA 001A	-4	-----	1	---	1	---	1	-----	000101								
122	NA 066B	--	2	---	1	---	4	---	1	-----	000101							
130	NA 060A	-1	-----	-----	-----	000101												
131	NA 730A	4	-----	-----	-----	000101												
134	NA 022A	2	-----	1	-----	000101												
135	NA 094B	1	-----	-----	-----	000101												
143	NA 562A	-1	-----	-----	-----	000101												
164	NI 008A	1	--	1	---	11	-----	000101										
167	NI 043A	-1421	--	11	---	1	---	1	-----	000101								
169	NI 027A	-32	-----	231	---	1	---	1	-----	000101								
173	NI 191A	1	-----	-----	-----	000101												
174	NI 026A	14351521	---	1	---	312	---	1	---	1	---	1	---	1	---	000101		
192	RH0 03CO	2112	-----	3	---	-----	-----	000101										
195	RH 002A	-1	---	3	-----	-----	000101											
202	ST 011B	1	-----	-----	-----	000101												
220	NI 013G	1	-----	1	-----	-----	000101											
18	AM 004A	-1	---	5	---	21112	---	1211	---	1	---	1	---	1	-----	000110		
26	AU 003A	---	1	---	14234	---	1	---	14	-----	000110							
40	CO 001B	-23	---	11	---	1	---	13	---	1	---	11	---	11	---	1	-----	000110
77	EP 004A	-----	2	---	1	---	1	-----	-----	000110								
121	NA 066A	-----	1	---	2	-----	1	-----	-----	000110								
127	NA 056A	-1	-----	11	---	1	-----	1	-----	000110								
133	NA 055A	-13	-----	-----	-----	1	-----	-----	000110									
165	NI 017A	----	2	-----	-----	1	-----	-----	000110									
176	NI 006A	---	12	-----	1	-----	1	-----	-----	000110								
189	RC 001A	---	5	---	1232	---	2	-----	12	---	1	-----	000110					
196	RH 006A	-----	2	-----	1	-----	-----	000110										
216	SY 015A	-----	11	---	31	---	1	---	111	-----	000110							
17	AM 003A	-1	-----	2142	---	1	-----	1	---	1	-----	000111						
45	CY 003A	1	---	2	---	3311	---	422	---	1	---	1	---	12	---	11	-----	000111
4	AC 032A	---	1	---	1	-----	1	-----	1	-----	001000							
27	AU 003C	---	2	---	54412	---	111	---	11	---	54	-----	001000					
32	BR 001A	-----	1	-----	-----	1	-----	-----	001000									
101	GO 021A	-----	1	-----	-----	1	-----	-----	001000									
136	NA 102A	--	1	---	2	---	111	---	1	---	1	---	211	-----	001000			
140	NA 025A	-----	1	---	11	---	1	-----	1	---	1	-----	001000					
188	PI 007A	-----	1	-----	-----	1	-----	-----	001000									
198	SA 001A	-----	1	-----	-----	1	-----	-----	001000									
204	ST 012A	-----	1	-----	-----	2	-----	-----	001000									
13	AM 084A	-----	1	---	1	---	12	-----	-----	001001								
137	NA 030A	-----	1	-----	1	-----	-----	001001										
163	NI 002A	---	1	---	1	---	1	---	14	-----	001001							
168	NI 031A	---	1	---	1	---	1	---	11	---	1	-----	001001					
175	NI SOCI	---	1	-----	-----	1	-----	-----	001001									
184	PI 005A	-----	1	-----	1	---	1	-----	-----	001001								
218	SY 001A	---	1	---	1	---	21	---	1	---	4112	---	1	---	1	-----	001001	
8	AC 002A	-----	2	-----	-----	-----	-----	001010										
28	AU 001A	-----	1	-----	-----	-----	-----	001010										
38	CO 005A	-----	1	---	1	-----	1	---	3	-----	001010							
51	CM 022A	-----	14	-----	-----	-----	-----	001010										
106	GO 014A	-----	1	---	1	---	1	-----	-----	001010								
129	NA 322A	-----	1	-----	-----	-----	-----	001010										
156	NA 168A	-----	1	-----	-----	-----	-----	001010										
217	SY 013A	-----	1	-----	-----	-----	-----	001010										
24	AU 005A	-----	1	-----	-----	-----	-----	001011										
30	AU POTR	-----	3	-----	-----	-----	-----	001011										

52	CM 016A	-----1-----	001011
58	CM 031A	-----1-----	001011
79	EU 002B	-----2-----	001011
80	EU 047A	-----2-----	001011
82	EU 048A	-----1-----4-1-----	001011
83	EU ERUC	-----1-----	001011
97	FU 002K	-----4-----	001011
109	GO 013A	----1-11-1-111--1121111224211--	001011
124	NA 118A	-----111-----43-----	001011
139	NA 123A	-----1-----	001011
150	NA 005A	-----5-----12-----	001011
181	PI 015C	-----1-----1-3-----	001011
182	PI 012A	-----1-----	001011
183	PI 001A	-----1-----	001011
186	PI CFMC	-----4-----	001011
187	PI 022A	-----1---2-1-----	001011
197	ST PHOE	-----1-----	001011
199	ST SP	-----1-----	001011
203	STF RAG2	-----3-----	001011
145	NA 014A	-----112-4-1-11---111---111---1---1---	00110
170	NI 009A	2114152-3---11111-41123--11411-111---1---	00110
171	NI 033A	1-11246-1---1-111-----211-221--11-----	00110
41	CO 001C	--2---1444143421-2412361-2---11-1111---11-	00111
56	CM 032A	-----11-1-111--1-----1-----	00111
102	GO 024C	-----13-----1-----	01000
185	PI 011A	-----1-11-----1-----	01000
5	AC 001A	---11---1-----552--4-----1--	010010
60	CM 003A	-----5-----	010010
84	EUSP	-----1-----	010010
96	FU 002K	-----1-----	010010
114	GYOB	-----1-----	010010
138	NA 112A	-----1-----	010010
152	NA 171A	-----1-----	010010
212	SY 009A	-----23-2-----	010011
126	NA 007A	-----2-2-113--1-111--1-----	0101
213	SY 017A	--1-----1-----2-3-----1-----	0101
6	AC 001D	-----1-1-1-1-1-----1-----1-	01100
9	AC 013A	-----1-1-1-22111-113114775--11112211-----	01100
209	SY 003A	-----1-----1-1421-11-1-1-----1--	01100
100	GO 020A	-----1-----1-----1-----1	01101
103	GO 004A	-----1-1-1-1-----1-----1211-1-1-----	01101
90	FR 008A	-----467631-2-----2---11177	0111
214	SY 002A	-----1-1-1-1-----1-----	0111
14	AM 001A	-----21-1-----1--11-----	100
76	EP 001A	-1---1---311-1-1-----1---11111-----1	100
95	FR 007C	-----21-----1-1---1-11-----	100
208	SU 007A	-----1-----1-----	100
57	CM 004A	-----1---1-----1-1-1111--2444311-1----	101000
10	AM 118A	-----1-----1-----	101001
31	BR 010A	-----1-----1252211-111--	101001
81	EU 017A	-----1-----	101001
94	FR 007A	-----11-----1-----242111-----	101001
132	NA 399A	-----1111-1-----	101001
142	NA 138A	-----2-----	101001
159	NIA MPHHR	-----1-1-1-----	101001
161	NI 003B	-----1-----12-----	101001
162	NI EPI	-----1-1-----	101001
179	NI 186A	-----32131--1-----	101001
180	OP 001A	-----1-----111-1-----	101001
207	SU 012A	-----1-----	101001
211	SY 061A	-----12--2-----	101001
215	SY 002D	-----1-----	101001
25	AU 005H	-----311-----11-12323--	101010
29	AU 001E	-----1---11--1	101010
34	CA 014A	-----1-----	101010
35	CA 004A	-----1-----	101010
46	CY 009A	----1-1-21-1---1---1---155456466676--	101010
54	CM 007A	-----11112111111--	101010
64	DP 009A	-1---1---1---1---11111311111--	101010
66	DP 003A	-----1---211--1--	101010
67	DP 001A	-----1-----	101010
91	FR 011A	-----1-----1-111--11--	101010
113	GO 008B	-----1-1-1-1-1--	101010
128	NA 314A	-----11-1111-1-1--	101010
155	NA 027E	-----1-----1-1-11-11-11-	101010
92	FR 001A	---1---11---1---21-----3322121-1-1-4	101011
59	CM 031C	-----1-----1---1-11-11-----	101100



## Appendix 6: Radionuclide data for core AV/98

### *<sup>210</sup>Pb data*

Depth (cm)	Total <sup>210</sup> Pb (Bq kg <sup>-1</sup> )	1σ (Bq kg <sup>-1</sup> )	Supported <sup>210</sup> Pb (Bq kg <sup>-1</sup> )	1σ (Bq kg <sup>-1</sup> )	Unsupported <sup>210</sup> Pb (Bq kg <sup>-1</sup> )	1σ (Bq kg <sup>-1</sup> )	Dry weight (g)
0-1	168	± 16	28	± 9	140	± 18	3.83
1-2	171	± 12	38	± 10	133	± 16	4.83
2-3	166	± 14	36	± 10	130	± 19	6.03
3-4	130	± 10	42	± 6	89	± 13	6.36
4-5	150	± 7	41	± 5	109	± 10	6.62
5-6	125	± 9	38	± 4	87	± 11	6.98
6-7	97	± 10	38	± 8	59	± 13	7.63
7-8	62	± 6	32	± 5	30	± 9	8.49
8-9	48	± 8	35	± 6	12	± 11	8.52
9-10	43	± 8	30	± 6	13	± 10	10.33
10-11	42	± 7	39	± 7	3	± 11	7.6
11-12	61	± 10	38	± 8	23	± 14	7.22
12-13	46	± 8	29	± 5	16	± 10	7.38
13-14	52	± 6	28	± 4	24	± 8	8.96
14-15	34	± 6	35	± 5	0	± 9	7.67
15-16	46	± 8	26	± 4	21	± 9	9.14
16-17	29	± 5	23	± 4	6	± 7	9.12
17-18	24	± 6	22	± 4	2	± 8	10.15
18-19	21	± 8	31	± 5	0	± 11	12.35
19-20	30	± 8	29	± 4	2	± 9	9.25

### *Manmade radionuclides*

Depth (cm)	<sup>137</sup> Cs (Bq kg <sup>-1</sup> )	1σ (Bq kg <sup>-1</sup> )	<sup>241</sup> Am (Bq kg <sup>-1</sup> )	1σ (Bq kg <sup>-1</sup> )
0-1	0			
1-2	0			
2-3	0			
3-4	16	± 5		
4-5	18	± 4	2	Detection limit
5-6	16	± 4	1	Detection limit
6-7	18	± 6		
7-8	8	± 3		
8-9	Detected			
9-10	11	± 5		
10-11	0			

## Appendix 7: Limnological Profiles Data from Laguna de Juanacatlán

### Location 1

Depth (m)	Temp (°C)	DO (mg/l)	EC (mS)	turbidity (ETU)	pH	nitrate (mg/l)
0	21.3	5.88	0.136	0	8.65	0.14
0.7	21.3	5.61	0.134	0	8.51	0.24
2.7	21.1	5.69	0.132	0	8.27	0.36
4.7	20.4	5.31	0.134	0	7.81	0.54
6.7	19	3.11	0.136	1	7.23	0.52
8.7	16.9	0.1	0.142	4	6.98	0.7
10.7	13.8	0.1	0.154	4	6.95	1.61
12.7	13.4	0.11	0.156	3	6.94	2.27
14.7	13.2	0.13	0.156	3	6.95	2.78
16.7	13.1	0.14	0.162	3	6.93	2.65
18.7	13.1	0.17	0.164	3	6.92	1.75
20.75	13.3	0.23	0.192		6.79	0.14

### Location 2

Depth (m)	Temp (°C)	DO (mg/l)	E.C. (mS)	turbidity (ETU)	pH	nitrate (mg/l)
0	21.5	6.2	0.136	0	8.72	0.17
2	21.2	6.11	0.134	0	8.57	0.26
4	20.5	5.95	0.134	0	8.36	0.33
6	19.9	4.54	0.136	1	7.74	0.27
7	19.6	3.14	0.138	1	7.47	0.26
8	18.3	0.29	0.142	2	7.33	0.19
9	16.2	0.05	0.135	6	7.16	0.27
10	14.7	0.05	0.154	9	7.04	0.24
12	13.4	0.05	0.156	3	7.04	0.28
14	13.3	0.07	0.156	3	7.09	0.3
16	13.2	0.11	0.16	8	7.25	0.34

### Location 3

0	21.3	6.25	0.136	0	8.78	0.21
2	21	6.22	0.134	0	8.68	0.26
4	20.5	5.92	0.132	0	8.36	0.32
6	20	4.89	0.134	8	7.8	0.28
7	19.6	3.43	0.136	7	7.55	0.33
8	18.8	1.13	0.14	10	7.41	0.19
9	16	0.03	0.148	6	7.23	0.18
11	13.6	0.03	0.154	4	7.18	0.26
13	13.3	0.03	0.156	3	7.19	0.28
15	13.2	0.03	0.16	3	7.19	0.24
17	13.1	0.05	0.162	3	7.22	0.21
19	13.1	0.17	0.164	91	7.34	0.17

#### Location 4

Depth (m)	Temp (°C)	DO (mg/l)	EC (mS)	turbidity (ETU)	pH	nitrate (mg/l)
0	21.7	6.01	0.138	1	8.67	0.12
2	20.7	6.09	0.134	1	8.55	0.14
4	20.4	5.83	0.134	3	8.25	0.13
6	20.2	5.34	0.136	5	8	0.18
7	19.9	4.71	0.136	6	7.82	0.18
8	18.8	1.76	0.138	4	7.5	0.12
9	15.5	0.08	0.152	10	7.28	0
10	14	0.76	0.155	6	7.48	0

#### Location 5

Depth (m)	Temp (°C)	DO (mg/l)	EC (mS)	turbidity (E'	pH	nitrate (mg/
0	22.4	5.97	0.136	0	8.64	0
2	21.5	6.05	0.134	0	8.53	0
4	20.7	5.79	0.134	1	8.41	0
5	20.4	4.69	0.134	0	8.03	0
6	19.7	3.14	0.138	1	7.75	0
7	19.1	1.34	0.138	0	7.66	0
8	18.8	0.87	0.14	1	7.66	0
9	16.7	0.32	0.146	15	7.59	0

## Appendix 8: $^{210}\text{Pb}$ data for core JL/98

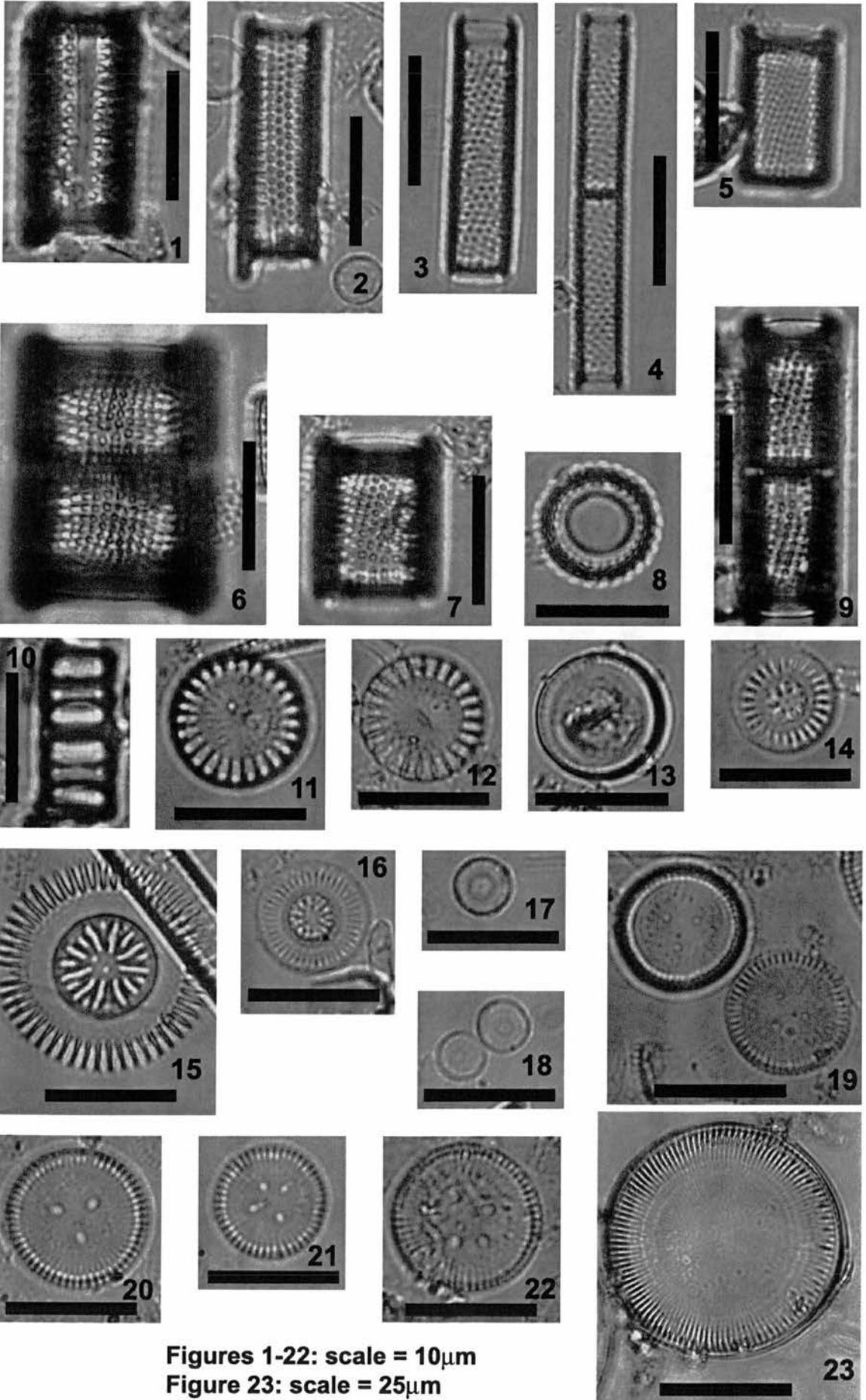
Depth (cm)	Total $^{210}\text{Pb}$ (Bq kg $^{-1}$ )	1 $\sigma$ (Bq kg $^{-1}$ )	Supported $^{210}\text{Pb}$ (Bq kg $^{-1}$ )	1 $\sigma$ (Bq kg $^{-1}$ )	Unsupported $^{210}\text{Pb}$ (Bq kg $^{-1}$ )	1 $\sigma$ (Bq kg $^{-1}$ )	Dry weight of section (g)
0-1	240	$\pm 30$	90	$\pm 27$	150	$\pm 41$	0.7
1-2	146	$\pm 54$	85	$\pm 22$	61	$\pm 58$	1
2-3	170	$\pm 43$	80	$\pm 26$	90	$\pm 50$	1.0003
3-4	175	$\pm 43$	82	$\pm 18$	92	$\pm 46$	1.6
4-5	151	$\pm 36$	81	$\pm 14$	70	$\pm 38$	1.6002
5-6	125	$\pm 27$	59	$\pm 16$	66	$\pm 29$	2.0002
6-7	101	$\pm 27$	88	$\pm 22$	12	$\pm 29$	2
7-8	101	$\pm 19$	86	$\pm 17$	16	$\pm 21$	2.5
8-9	95	$\pm 20$	76	$\pm 11$	18	$\pm 21$	2.5
9-10	99	$\pm 16$	80	$\pm 12$	19	$\pm 17$	2.5
10-11	83	$\pm 19$	81	$\pm 12$	2	$\pm 20$	2.51
11-12	97	$\pm 22$	66	$\pm 16$	31	$\pm 24$	1.9999
12-13	96	$\pm 14$	71	$\pm 6$	25	$\pm 14$	3.506
13-14	94	$\pm 16$	64	$\pm 13$	29	$\pm 18$	2.501
14-15	86	$\pm 19$	76	$\pm 15$	10	$\pm 21$	2.5008

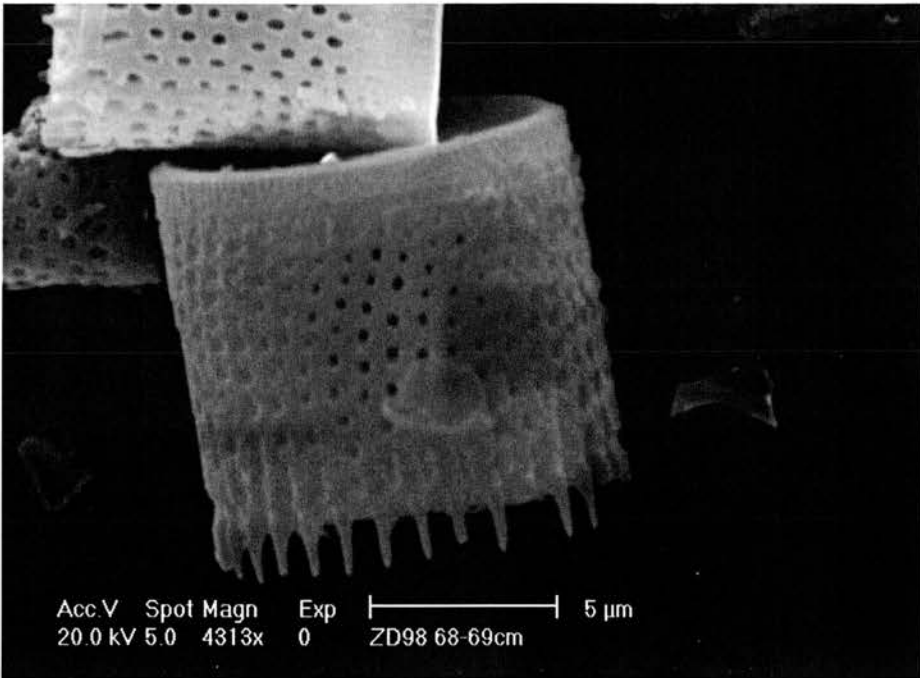
# **Diatom Plates**

## Plate 1

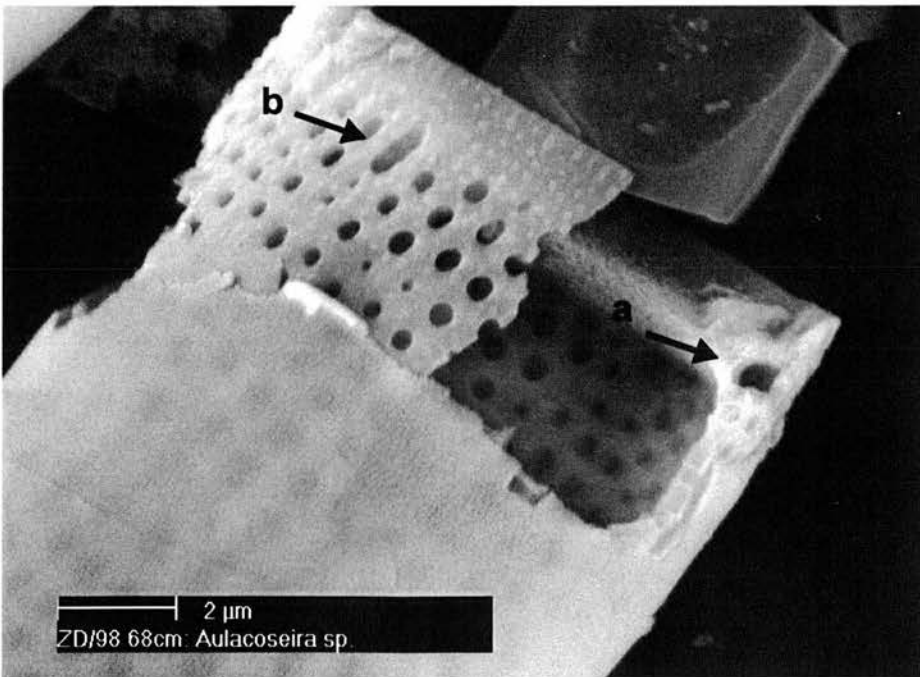
1. *Aulacoseira granulata* (Ehrenberg) Simonsen (Lago de Pátzcuaro: modern sample).
2. *Aulacoseira granulata* (Ehrenberg) Simonsen (Laguna de Juanacatlán: core material).
3. *Aulacoseira granulata* var. *angustissima* (Müller) Simonsen (Laguna de Juanacatlán: core material).
4. *Aulacoseira granulata* var. *angustissima* (Müller) Simonsen (Laguna de Zirahuén: modern sample).
5. *Aulacoseira ambigua* (Grunow) Simonsen (Laguna de Zirahuén: modern sample).
6. *Aulacoseira ambigua* cf. var. *robusta* Gasse (Laguna de Zirahuén: core material).
7. *Aulacoseira ambigua* cf. var. *robusta* Gasse (Laguna de Zirahuén: core material).
8. *Aulacoseira ambigua* cf. var. *robusta* Gasse, valve view (Laguna de Zirahuén: core material).
9. *Aulacoseira ambigua* cf. var. *robusta* Gasse (Laguna de Zirahuén: core material).
10. *Aulacoseira distans* var. *alpigena* Grunow (Laguna de Zirahuén: core material).
11. *Cyclotella meneghiniana* Kützing (Laguna Preciosa: modern sample).
12. *Cyclotella meneghiniana* Kützing (Laguna Preciosa: modern sample).
13. *Cyclotella caspia* Grunow (Laguna Alchichica: modern sample).
14. *Cyclotella stelligera* Cleve & Grunow (Lago de Zirahuén: core material).
15. *Cyclotella stelligera* Cleve & Grunow (Laguna de Juanacatlán: core material).
16. *Cyclotella stelligera* Cleve & Grunow (Laguna de Juanacatlán: core material).
17. *Cyclotella* "stelligeroid group" (Laguna de Juanacatlán: core material).
18. *Cyclotella* "stelligeroid group" (Laguna de Juanacatlán: core material).
19. *Cyclotella ocellata* Pantocsek (Lago de Zirahuén: core material).
20. *Cyclotella ocellata* Pantocsek (Lago de Zirahuén: core material).
21. *Cyclotella ocellata* Pantocsek (Lago de Zirahuén: core material).
22. *Cyclotella ocellata* Pantocsek (Lago de Zirahuén: core material).
23. *Cyclotella quillensis* Bailey (Laguna Alchichica: modern sample).

# Plate 1

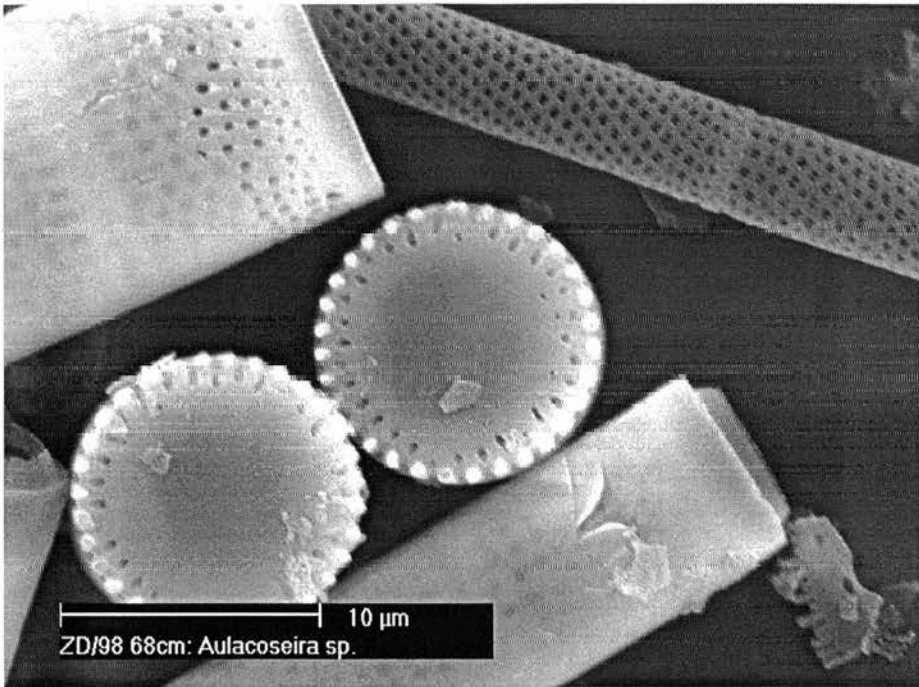




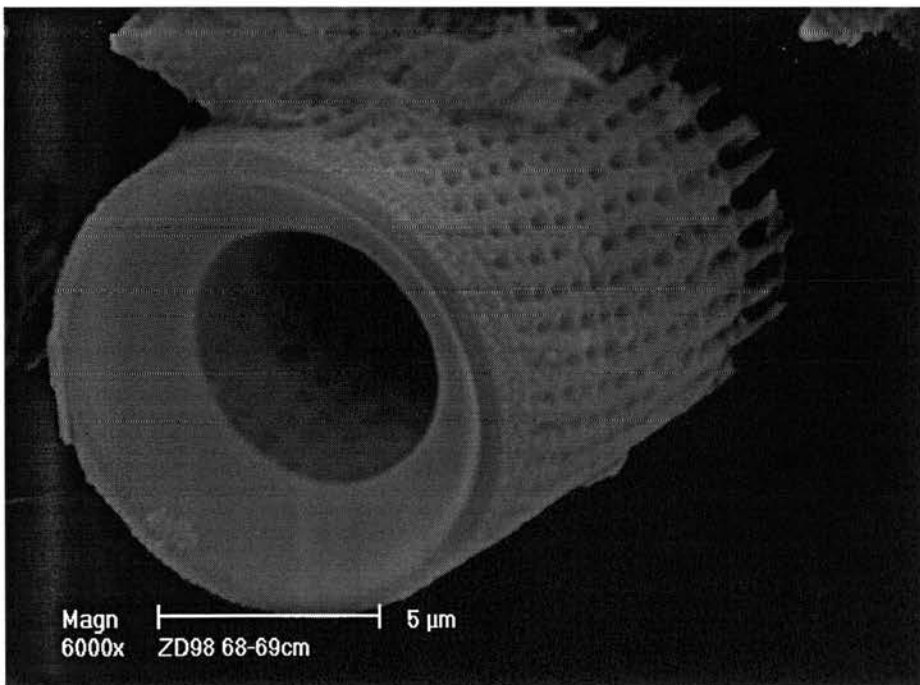
**Figure 1:** *Aulacoseira ambigua* cf. var. *robusta* (core material, Lago de Zirahuen) illustrating separation spines.



**Figure 2:** *Aulacoseira ambigua* cf. var. *robusta* (core material, Lago de Zirahuen) illustrating hollow Ringleist (a) and large external aperture of the rimoportula (b).

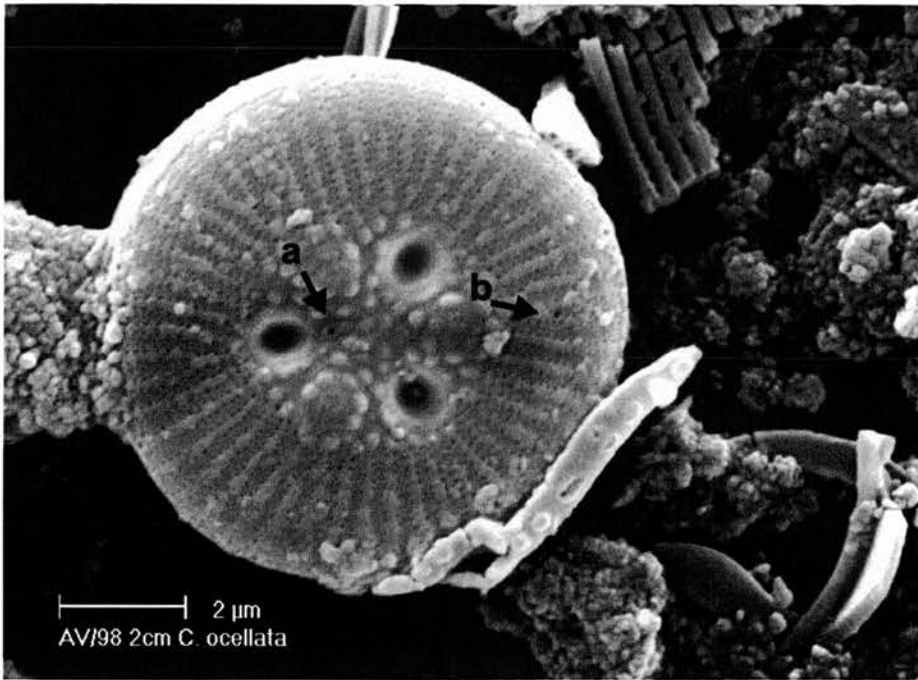


**Figure 1:** *Aulacoseira ambigua* cf. var. *robusta* (core material, Lago de Zirahuen). Note the lack of areolae on the valve face.

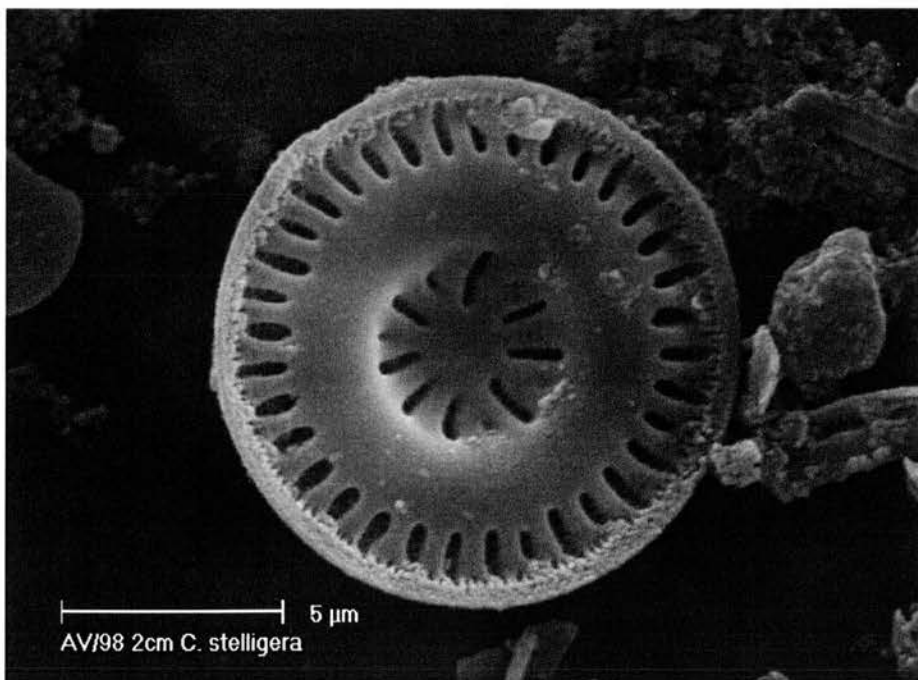


**Figure 2:** *Aulacoseira ambigua* cf. var. *robusta* (core material, Lago de Zirahuen) illustrating deep Ringleist.

## Plate 4

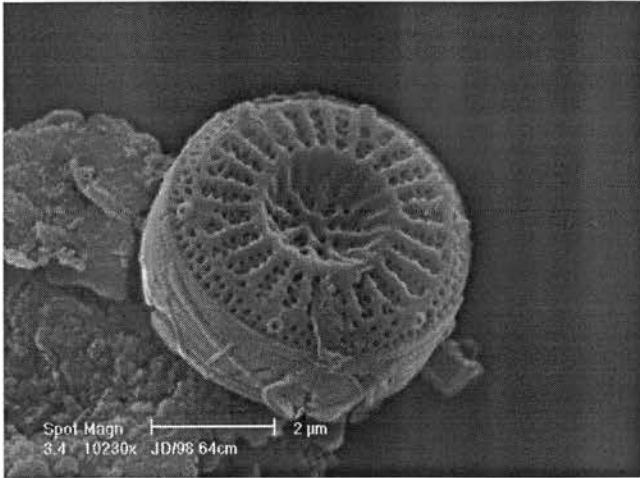


**Figure 1:** *Cyclotella ocellata* (core material, Lago de Zirahuen) showing valve face fultoportula (a) and external aperture of the rimoportula.

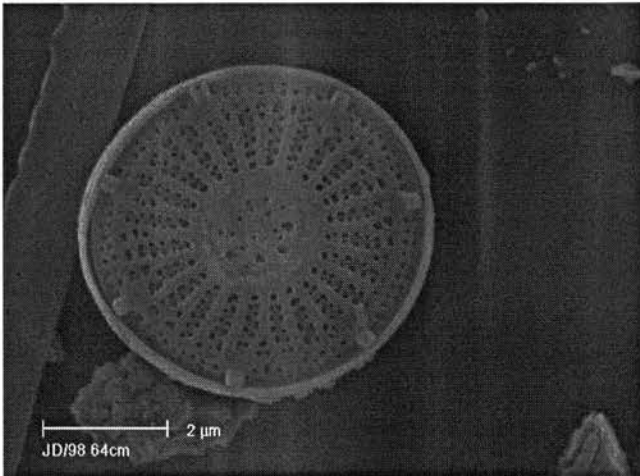


**Figure 2:** *Cyclotella stelligera* (core material, Lago de Zirahuen).

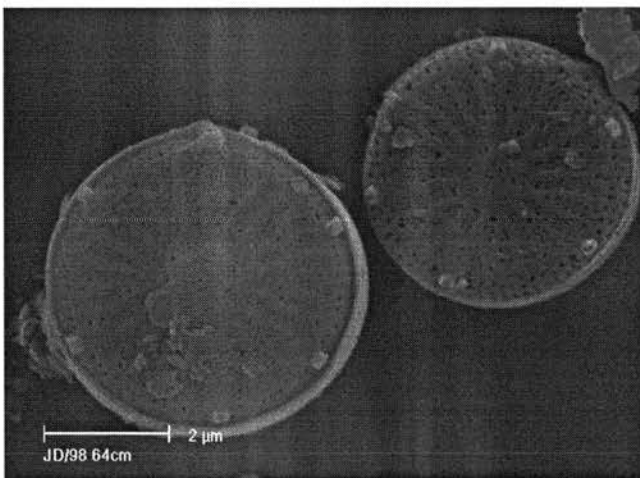
## Plate 5



**Figure 1:** *Cyclotella* stelligeroid group (core material, Juanacatlan), cf. *C. stelligera* var. *glomerata* (similar to Haworth & Hurley, 1986: Fig. 6).



**Figure 2:** *Cyclotella* stelligeroid group (core material, Juanacatlan), cf. *C. stelligera* var. *pseudostelligera* (similar to Haworth & Hurley, 1986: Fig. 15).

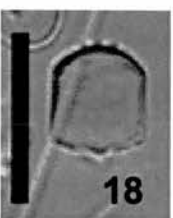
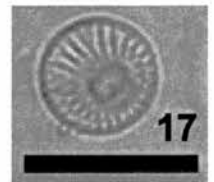
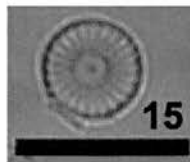
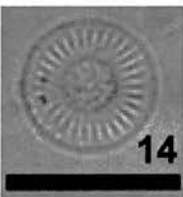
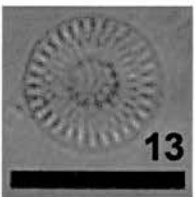
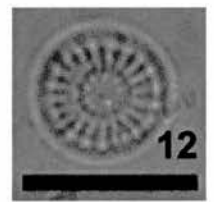
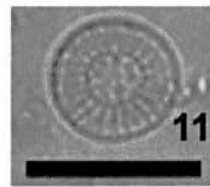
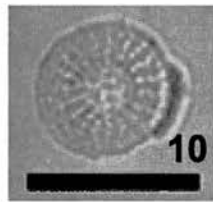
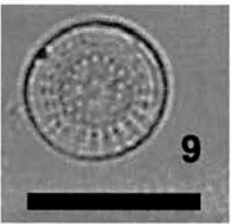
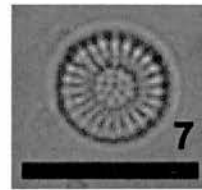
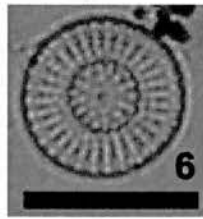
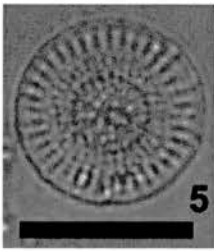
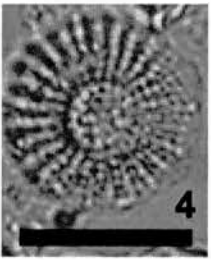
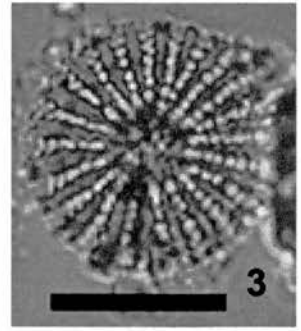
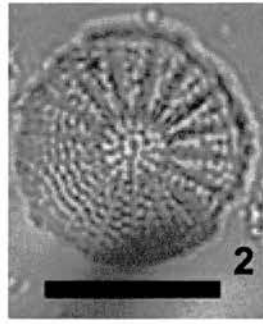
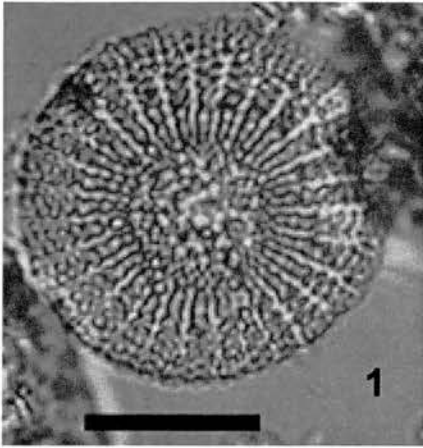


**Figure 3:** *Cyclotella* stelligeroid group (core material, Juanacatlan), cf. *C. stelligera* var. *pseudostelligera* f. *woltereckii* (similar to Haworth & Hurley, 1986: Figs. 19-20).

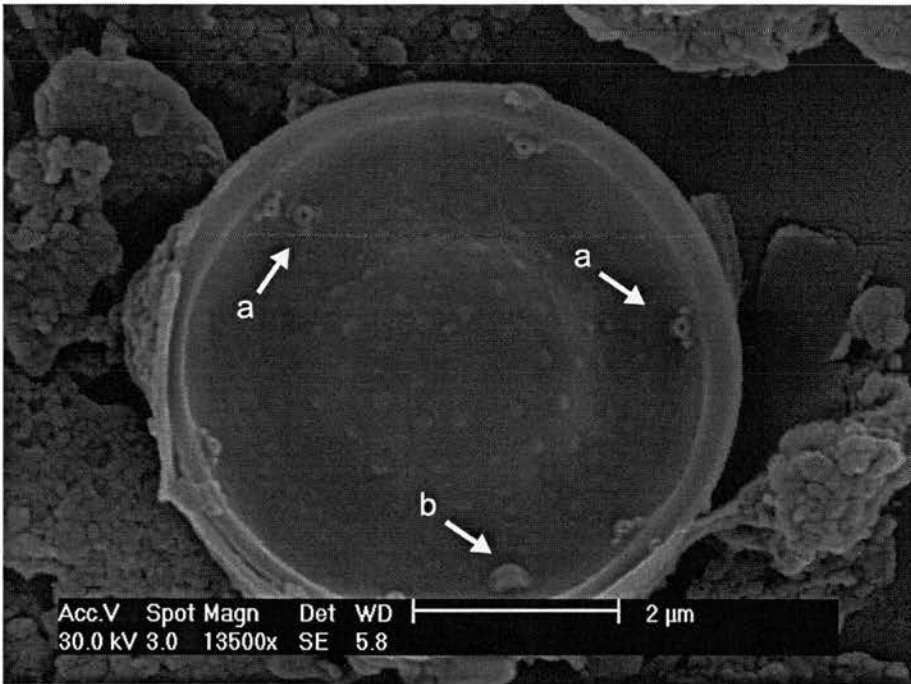
## Plate 6

1. *Stephanodiscus astraea* var. *intermedia* Fricke (Lago de Atotonilco: modern sample).
2. *Stephanodiscus astraea* var. *intermedia* Fricke (Lago de Atotonilco: modern sample).
3. *Stephanodiscus asteroides* var. *intermedia* Gasse (Lago de Atotonilco: modern sample).
4. *Stephanodiscus minutulus* (Kützing) Cleve & Möller (Lago de Atotonilco: modern sample).
5. *Stephanodiscus* sp. 1 (Lago de Cajititlán: modern sample).
6. *Stephanodiscus* sp. 1 (Lago de Cajititlán: modern sample).
7. *Stephanodiscus* sp. 1 (Lago de Cajititlán: modern sample).
8. *Stephanodiscus* sp. 1 (Lago de Cajititlán: modern sample).
9. *Stephanodiscus* sp. 2 (Lago de Chapala: modern sample).
10. *Stephanodiscus* sp. 2 (Lago de Chapala: modern sample).
11. *Stephanodiscus* sp. 2 (Lago de Chapala: modern sample).
12. *Stephanodiscus* sp. 2 (Lago de Chapala: modern sample).
13. *Cyclostephanos* sp. (Lago de Zirahuén: core material).
14. *Cyclostephanos* sp. (Lago de Zirahuén: core material).
15. *Cyclostephanos* sp. (Lago de Zirahuén: core material).
16. *Cyclostephanos* sp. (Lago de Zirahuén: core material).
17. *Cyclostephanos* sp. (Lago de Zirahuén: core material).
18. *Rhizosolenia* sp. resting spore (Laguna de Juanacatlán: core material).
19. *Chaetoceros muelleri* Lemmerman, resting spore (La Piscina de Yuriria: modern sample).

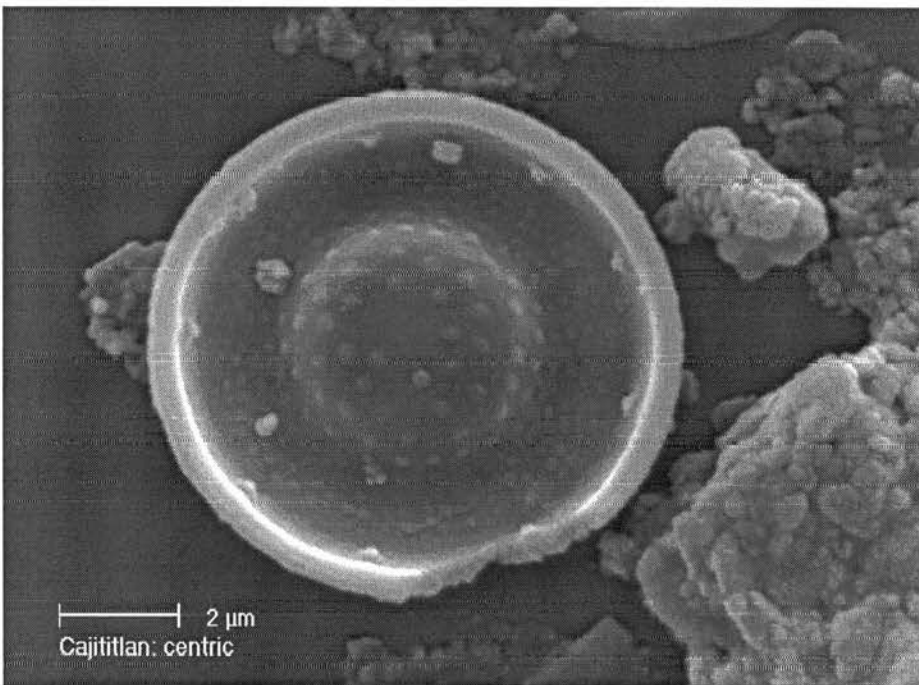
# Plate 6



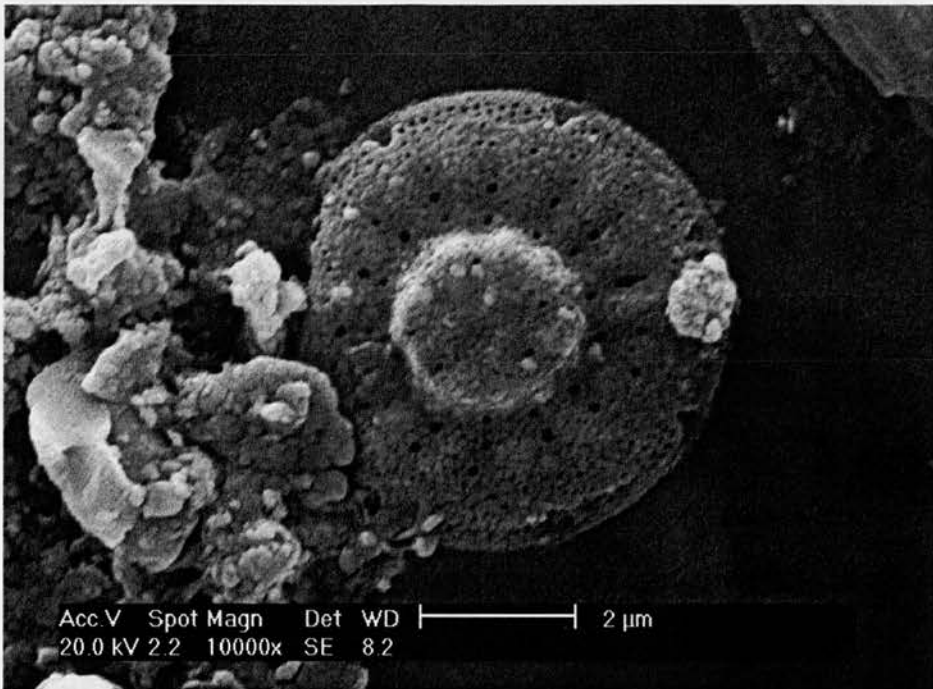
All Figures: scale = 10 $\mu$ m



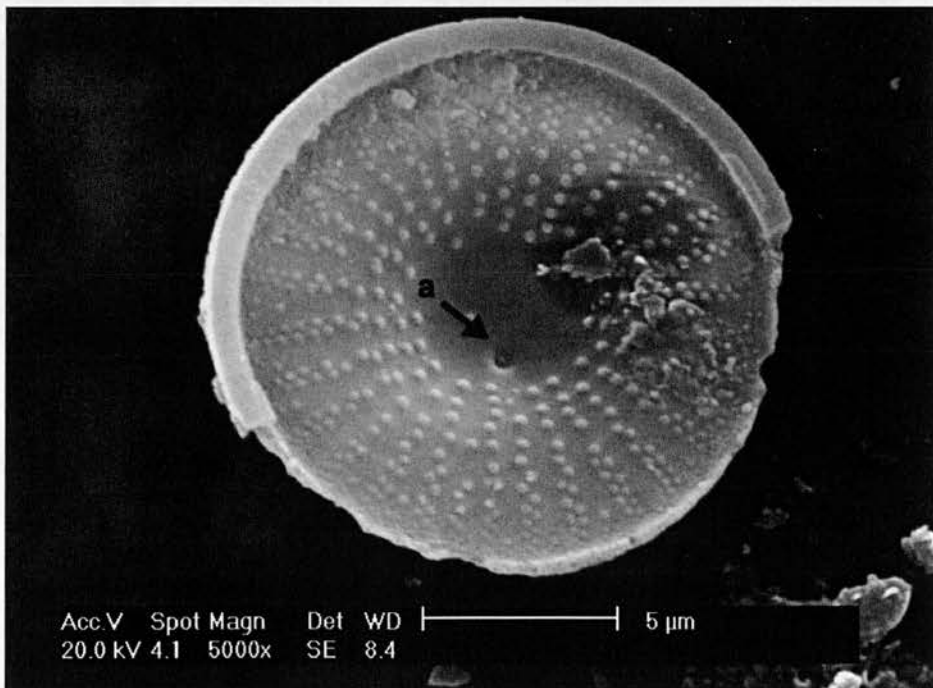
**Figure 1:** *Stephanodiscus* sp. (modern sample, Lago de Cajititlan). Internal valve view illustrating fultoportulae (a) and rimoportula (b).



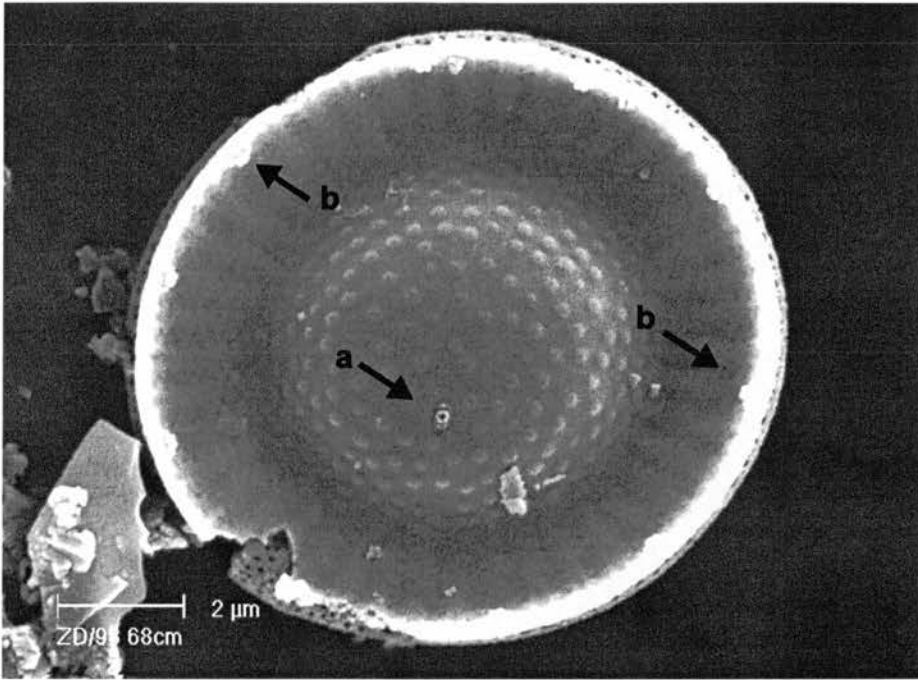
**Figure 2:** Internal view of *Stephanodiscus* sp. (Lago de Cajititlan). Note the lack of any marginal chambering.



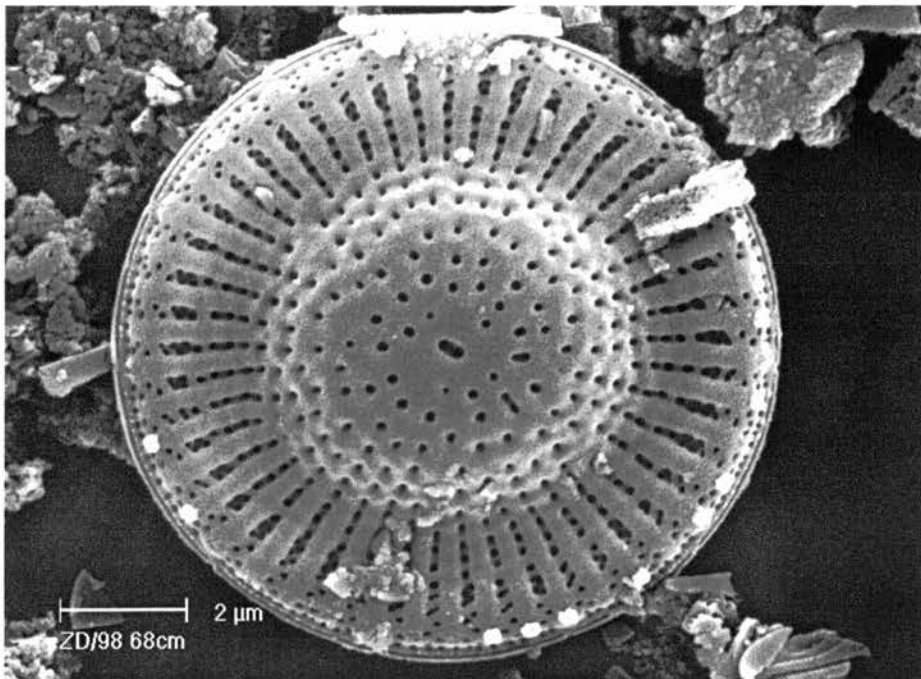
**Figure 1:** *Stephanodiscus* sp. (modern material, Lago de Chapala). External view of valve showing considerable signs of dissolution.



**Figure 2:** Internal view of *Stephanodiscus* sp. (Lago de Chapala) illustrating valve face fultoportula (a).

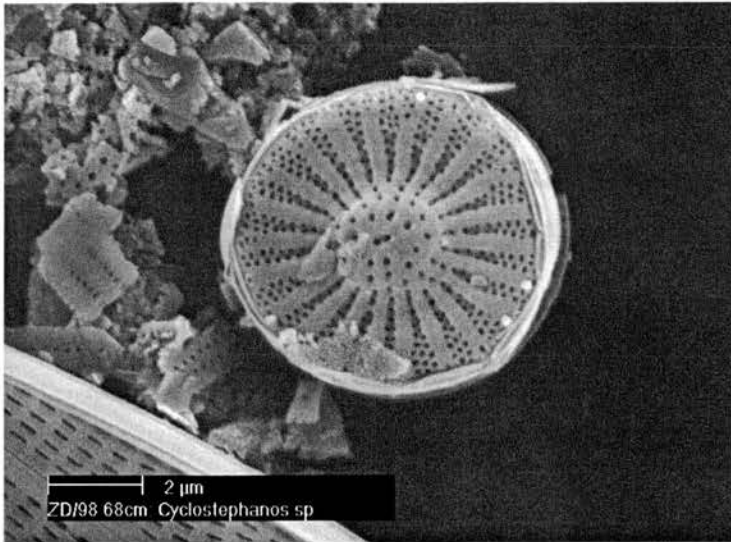


**Figure 1:** *Cyclostephanos* sp. (core material) Lago de Zirahuen). Internal view showing valve face fultoportula (a) and marginal fultoportulae (b).

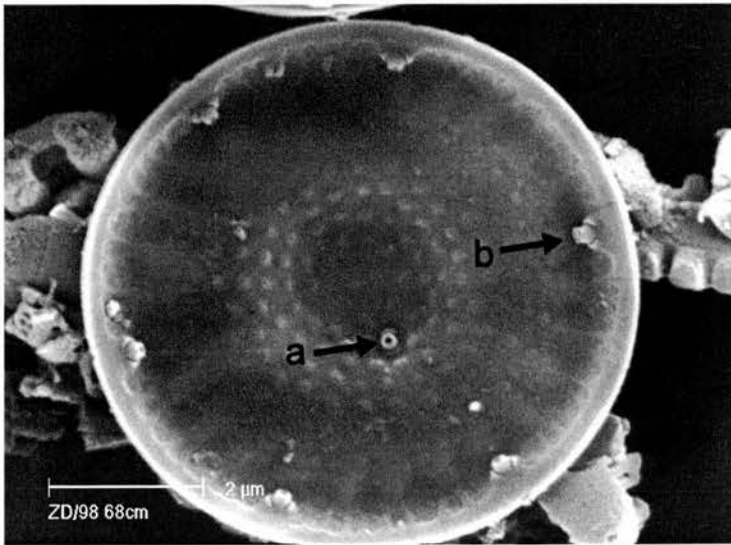


**Figure 2:** External view of *Cyclostephanos* sp. (core material, Lago de Zirahuen). There appear to have been spines on every interfascicle.

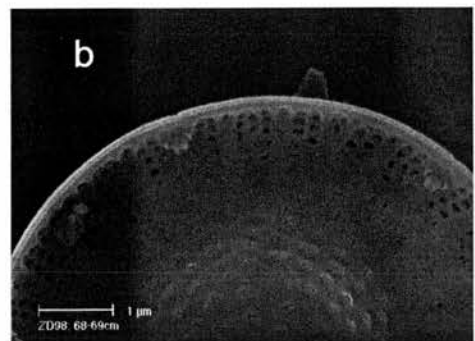
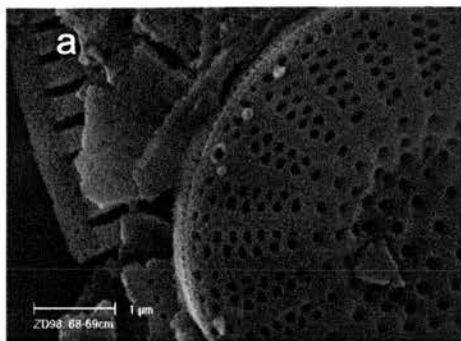
# Plate 10



**Figure 1:** External view of *Cyclostephanos* sp. (core material, Lago de Zirahuen).



**Figure 2:** Internal view of *Cyclostephanos* sp. (core material, Lago de Zirahuen) illustrating valve face fultoportula (a) and marginal fultoportulae (b).

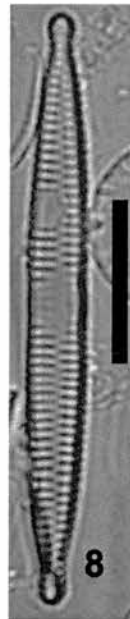
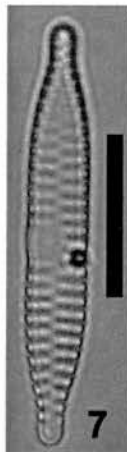
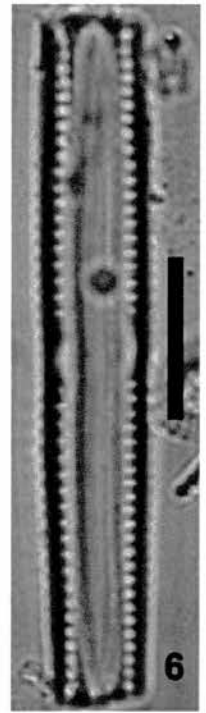
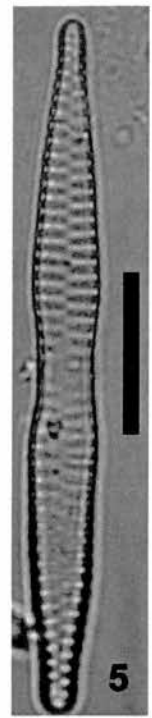
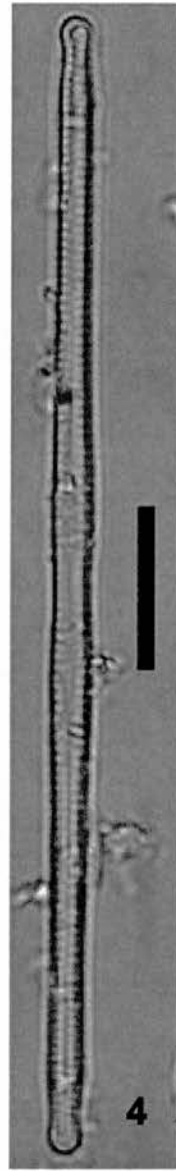
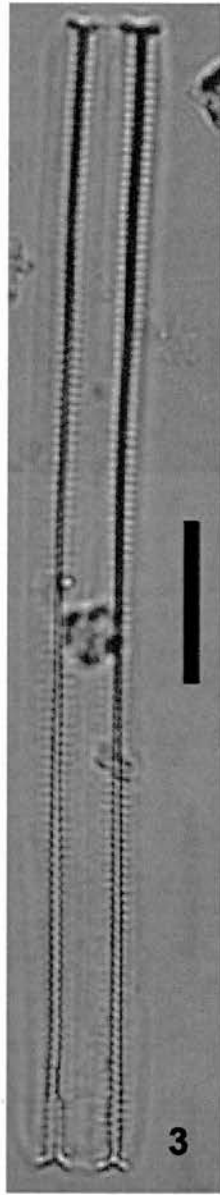
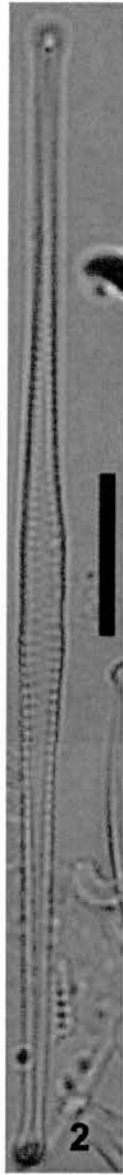
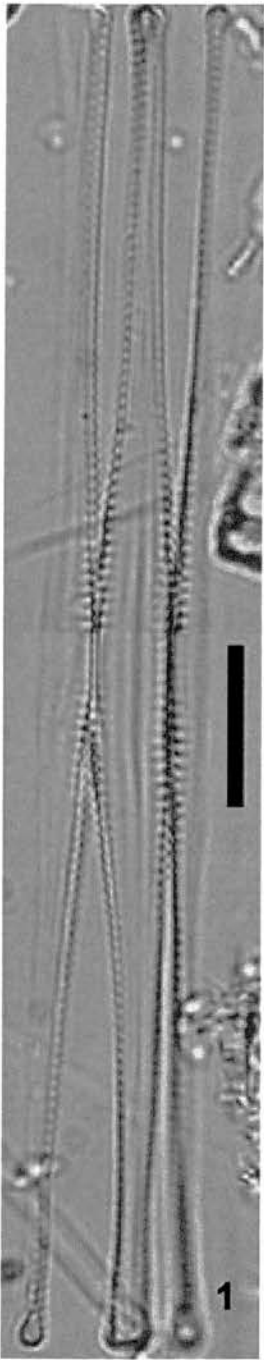


**Figure 3:** Close-up of valve edge in *Cyclostephanos* sp. (Zirahuen): (a) external view, (b) internal view.

## Plate 11

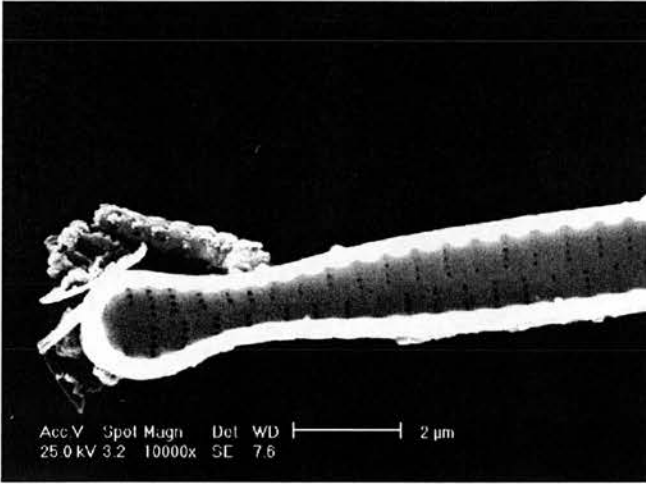
1. *Fragilaria crotonensis* Kitton, girdle view (Laguna de Juanacatlán: modern sample).
2. *Fragilaria crotonensis* Kitton (Lago de Zirahuén: modern sample).
3. *Fragilaria* cf. *capucina* Desmazières, girdle view (Lago de Zirahuén: core material).
4. *Fragilaria* cf. *capucina* Desmazières (Lago de Zirahuén: core material).
5. *Fragilaria capucina* var. *mesolepta* Rabenhorst (Lago de Chapala: modern sample).
6. *Fragilaria capucina* var. *mesolepta* Rabenhorst, girdle view (Lago de Chapala: modern sample).
7. *Fragilaria vaucheriae* (Kützing) Peters (Lago de Zirahuén: modern sample).
8. *Fragilaria vaucheriae* var. *capitellata* (Grunow) Patrick (Laguna Potrerillo: modern sample).

# Plate 11

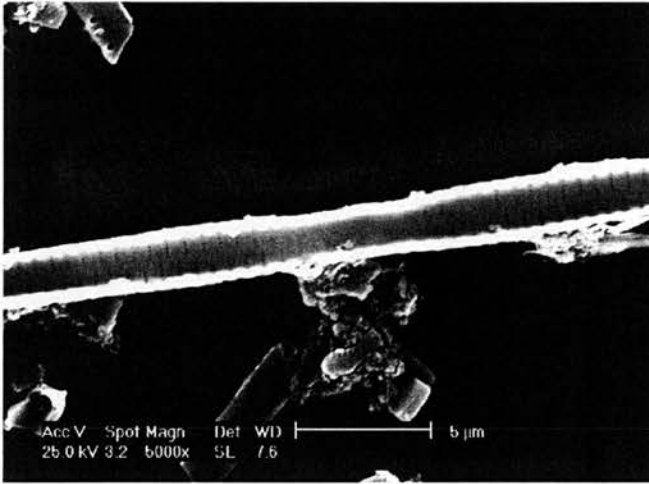


All Figures: scale = 10 $\mu$ m

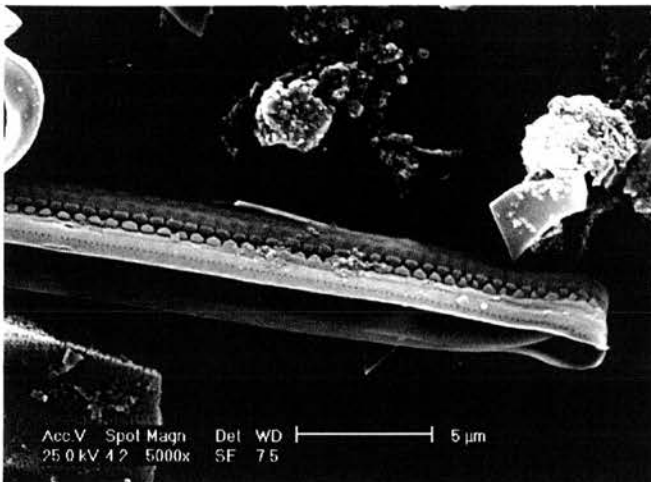
# Plate 12



**Figure 1:**  
*Fragilaria cf. capucina* (core material, Laguna Zirahuen) illustrating detail of the valve ends.



**Figure 2:**  
*Fragilaria cf. capucina* (core material, Laguna Zirahuen) illustrating detail of the central area.

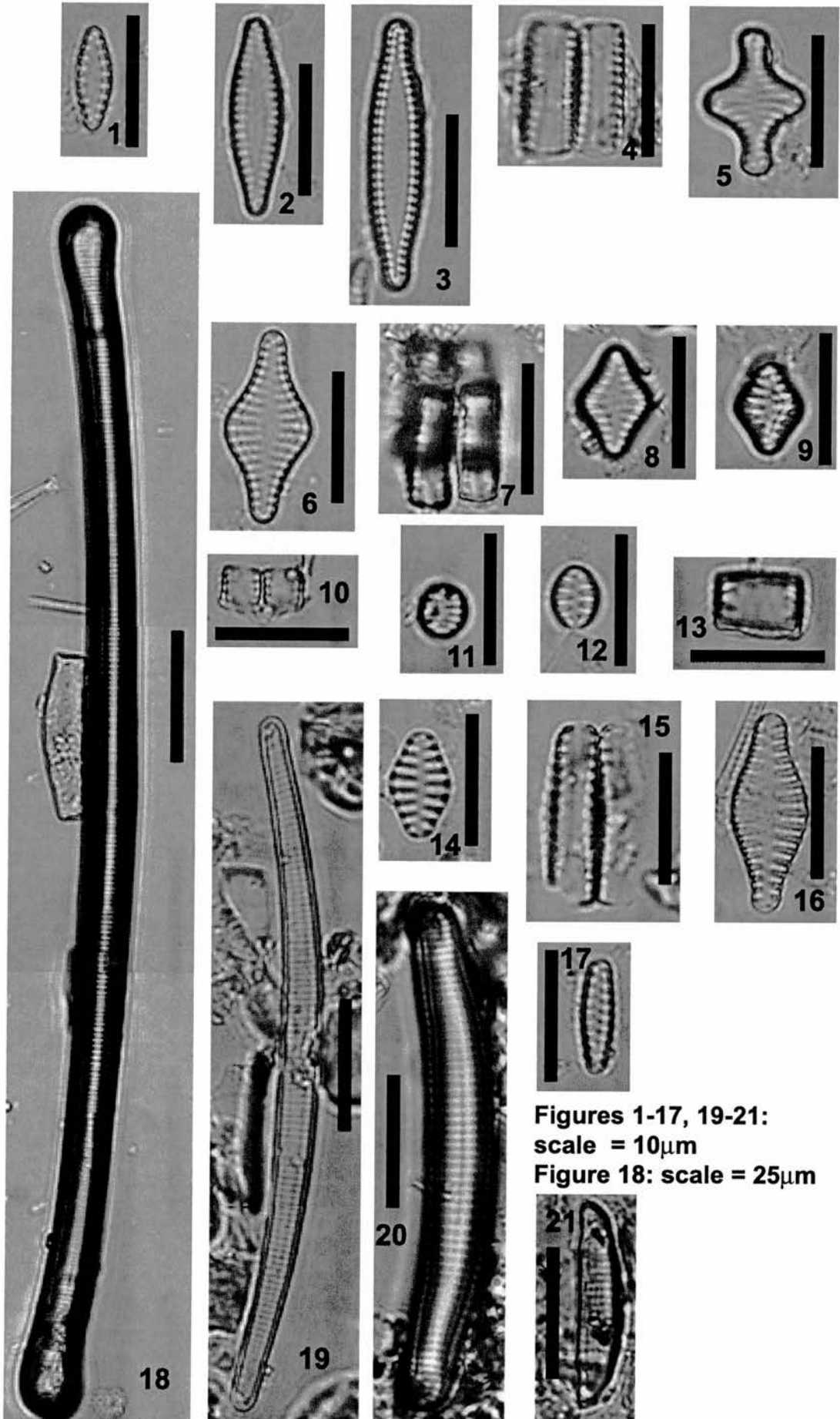


**Figure 3:**  
*Fragilaria cf. capucina* (core material, Laguna Zirahuen) illustrating the nature of the interlocking spines.

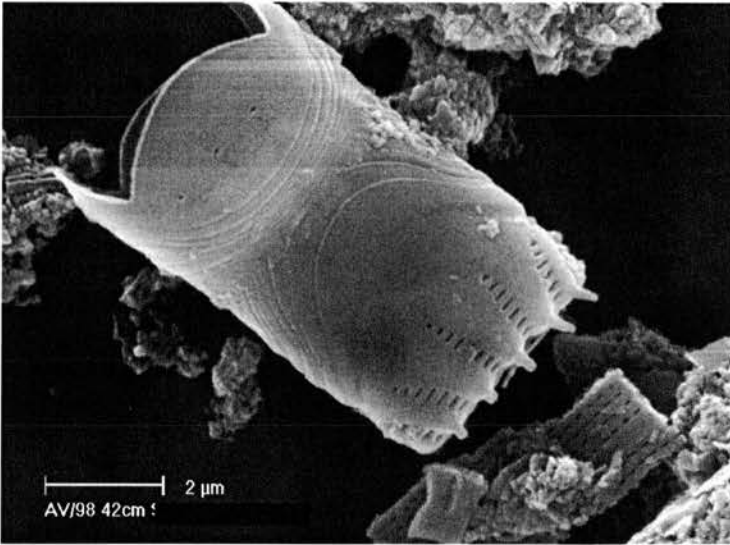
## Plate 13

1. *Fragilaria brevistriata* Grunow (Lago de Zirahuén: core material).
2. *Fragilaria brevistriata* Grunow (Lago de Zirahuén: core material).
3. *Fragilaria brevistriata* Grunow (Lago de Zirahuén: core material).
4. *Fragilaria brevistriata* Grunow, girdle view (Lago de Zirahuén: core material).
5. *Fragilaria construens* (Ehrenberg) Ralfs (Laguna de Juanacatlán: core material).
6. *Fragilaria construens* (Ehrenberg) Ralfs (Lago de Zirahuén: core material).
7. *Fragilaria construens* (Ehrenberg) Ralfs, girdle view (Laguna de Juanacatlán: core material).
8. *Fragilaria construens* (Ehrenberg) Ralfs, intermediate between nominate variety and var. *venter* (Lago de Zirahuén, core material).
9. *Fragilaria construens* var. *venter* (Ehrenberg) Grunow (Lago de Zirahuén: core material).
10. *Fragilaria construens* var. *venter* (Ehrenberg) Grunow, girdle view (Lago de Zirahuén: core material).
11. *Fragilaria construens* var. *venter* (Ehrenberg) Grunow (Lago de Zirahuén: core material).
12. *Fragilaria pinnata* Ehrenberg (Lago de Zirahuén: core material).
13. *Fragilaria pinnata* Ehrenberg, girdle view (Lago de Zirahuén: core material).
14. *Fragilaria pinnata* Ehrenberg (Lago de Zirahuén: core material).
15. *Fragilaria pinnata* var. *lancettula* (Schumann) Hustedt, girdle view (La Yerbabuena: modern sample).
16. *Fragilaria pinnata* var. *lancettula* (Schumann) Hustedt, (La Yerbabuena: modern sample).
17. *Opephora* sp. (Lago de Zirahuén: core material).
18. *Eunotia* cf. *flexuosa* (Brébisson) Kützing (Lago de Zirahuén: core material).
19. *Eunotia naegelii* Migula (Lagunilla de San Gregorio: modern sample).
20. *Eunotia pectinalis* var. *minor* (Kützing) Rabenhorst (Lagunilla de San Gregorio: modern sample).
21. *Eunotia incisa* Gregory (Lagunilla de San Gregorio: modern sample).

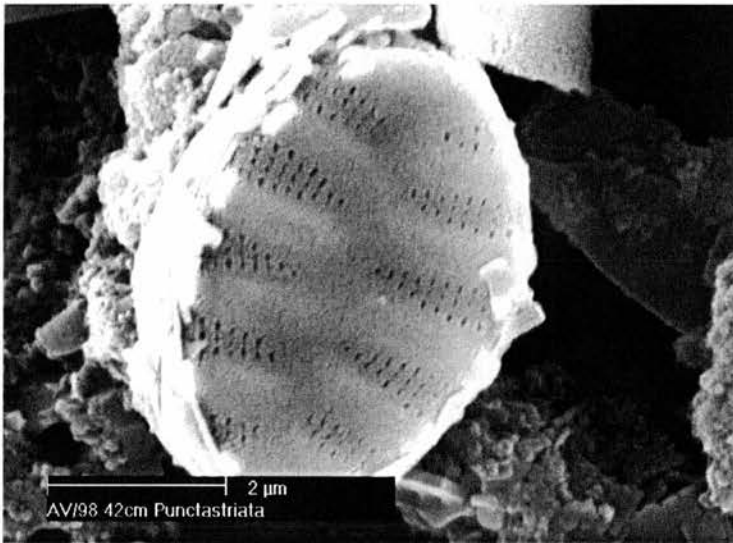
# Plate 13



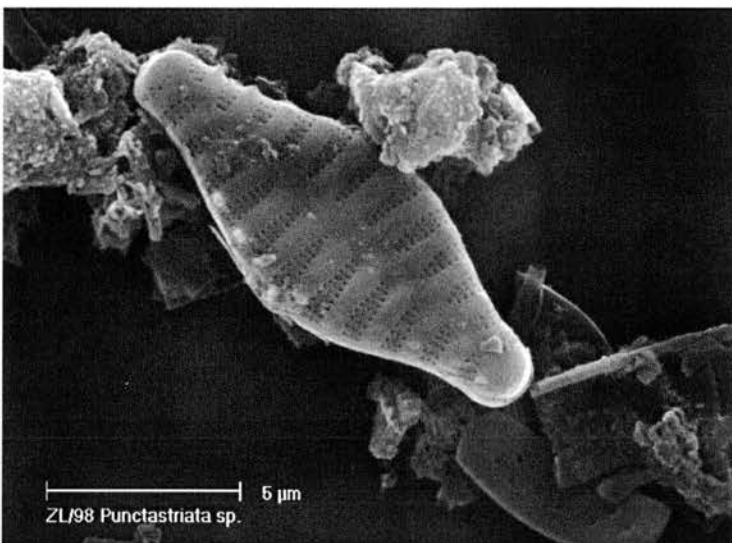
# Plate 14



**Figure 1:**  
*Fragilaria construens* var.  
*venter* (= *Staurosira*  
*construens*).  
Core material, Lago de  
Zirahuen.



**Figure 2:**  
*Fragilaria pinnata*  
(= *Punctastriata ovalis*?)  
Core material, Lago de  
Zirahuen.



**Figure 3:**  
*Fragilaria pinnata* var.  
*lancettula* (= *Punctastriata*  
*linearis*?).  
Core material, Lago de  
Zirahuen.

## Plate 15

1. *Synedra ulna* (Nitzsch) Ehrenberg (Laguna de Juanacatlán: modern sample).
  2. *Synedra acus* Kützing (Laguna de Juanacatlán: core material).
  3. *Synedra delicatissima* W. Smith (Laguna de Juanacatlán: core material).
  4. *Synedra delicatissima* var. *angustissima* Grunow (Laguna de Juanacatlán: core material).
- 4a. Detail of central area of same specimen in Figure 4.

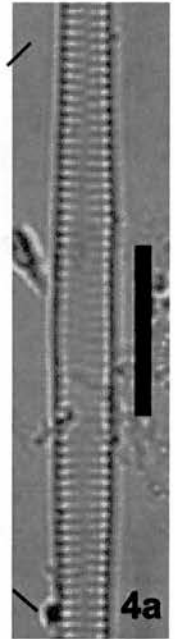
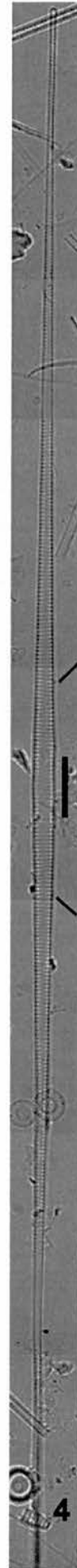
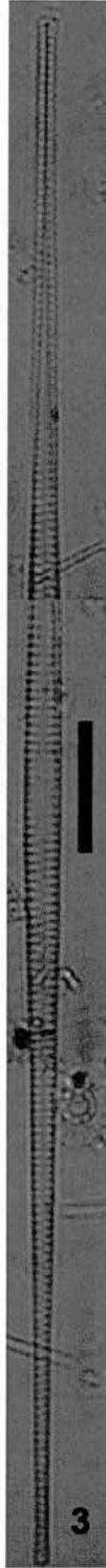
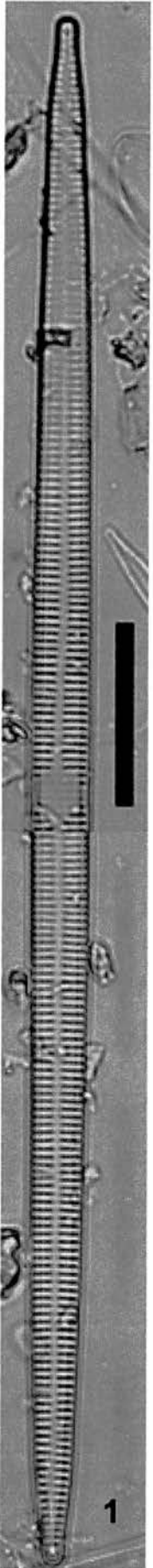
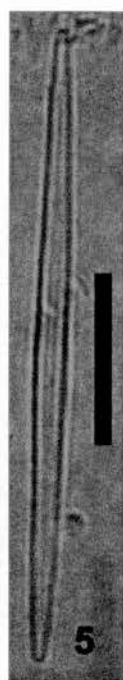
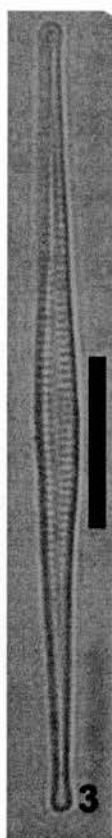
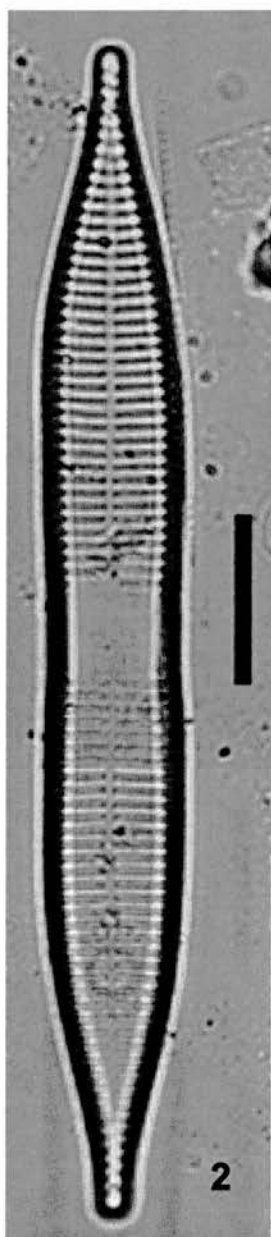
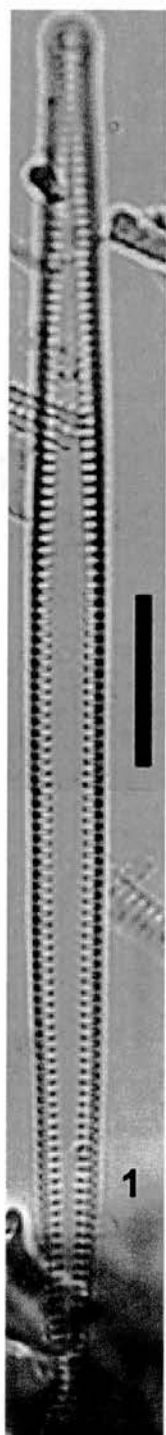


Figure 1: scale = 25 $\mu$ m  
Figure 2 - 4a: scale = 10 $\mu$ m

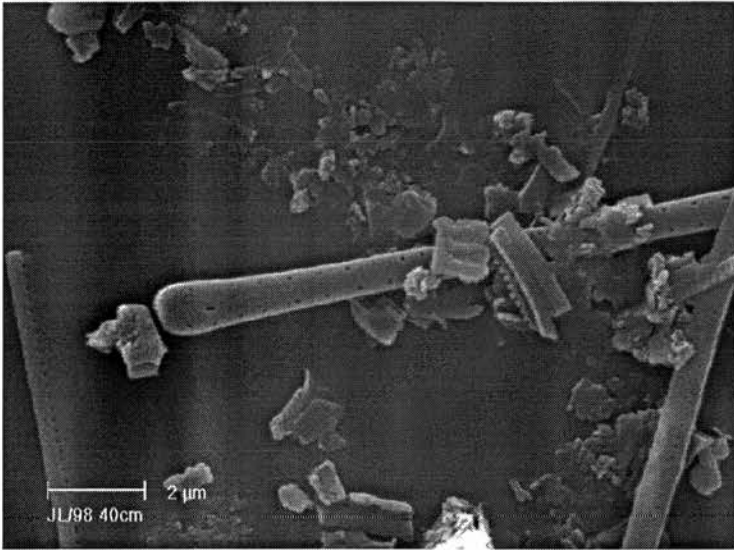
## Plate 16

1. *Synedra fasciculata* (C. Agardh) Kützing (Laguna Preciosa: modern sample).
2. *Synedra goulardii* Brébisson (Lago de Pátzcuaro: modern sample).
3. *Synedra tenera* W. Smith (Laguna de Juanacatlán: core material).
4. *Synedra tenera* W. Smith, deformed valve (Laguna de Juanacatlán: core material).
5. *Synedra nana* Meister (Laguna de Juanacatlán: core material).

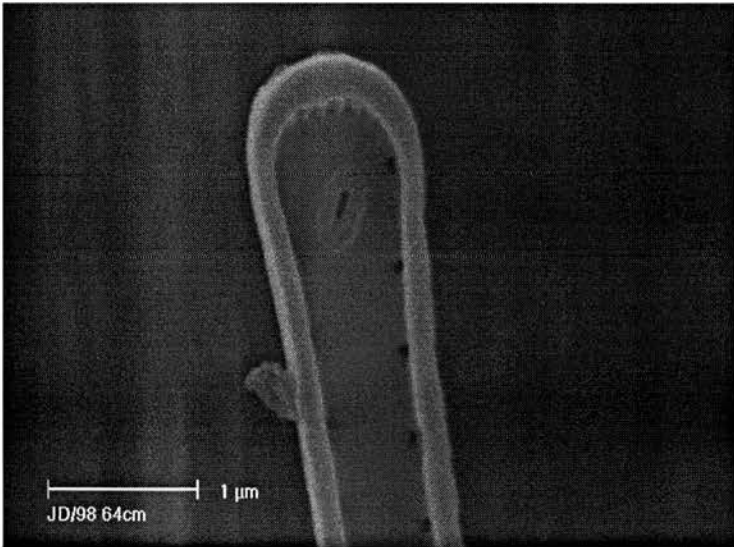
# Plate 16



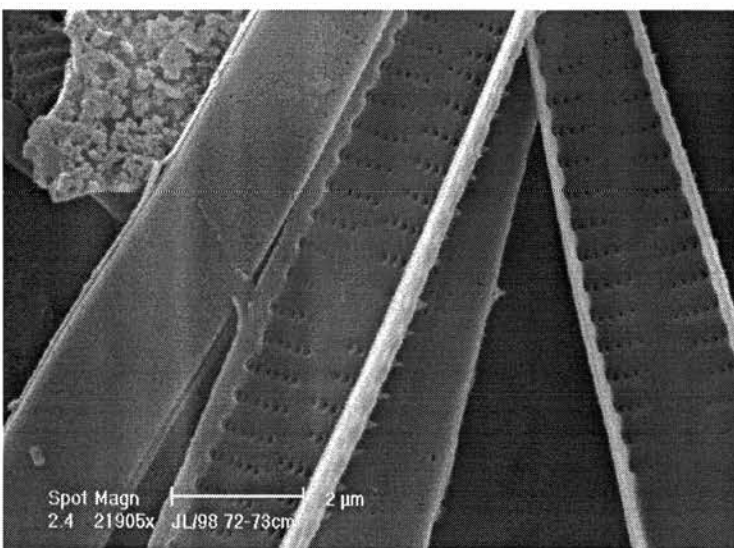
Figures 1-5: scale bar = 10 $\mu$ m



**Figure 1:** Valve end of *Synedra delicatissima* illustrating external aperture of the single rimoportula.



**Figure 2:** Valve end of *Synedra delicatissima* illustrating the single rimoportula and apical pore field.

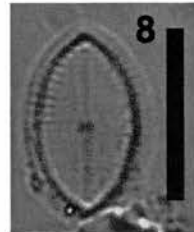
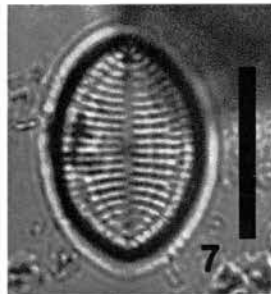
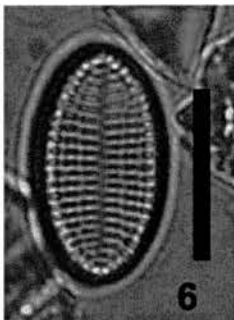
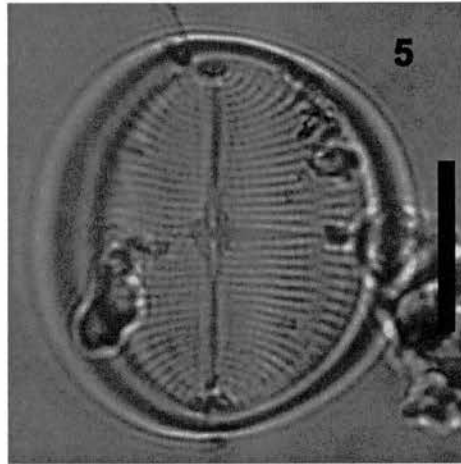
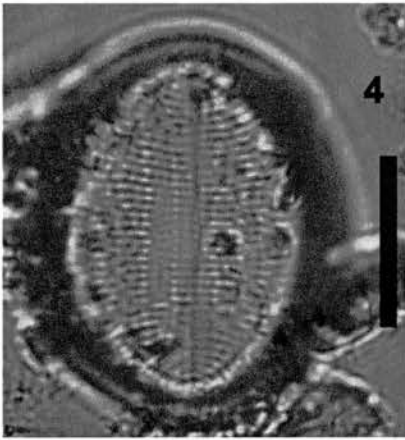
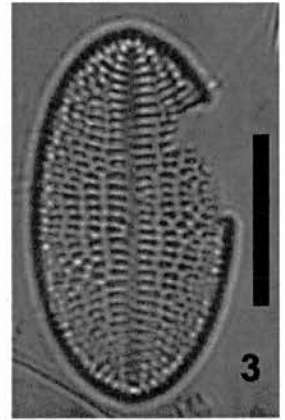
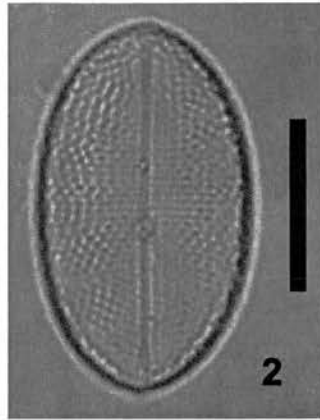
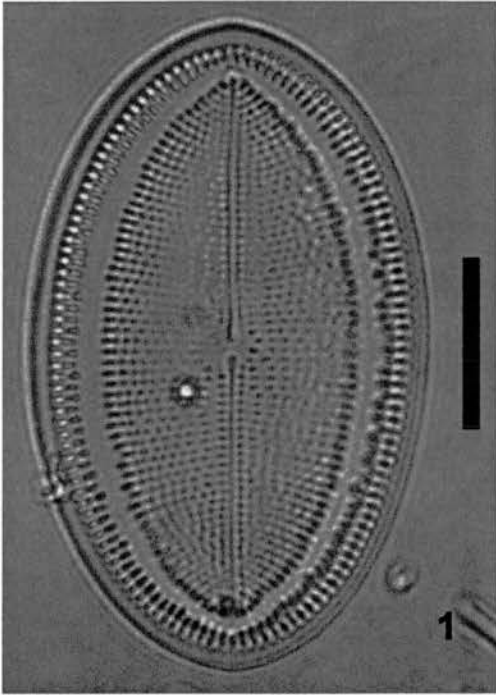


**Figure 3:** Central area of *Synedra tenera*.

## Plate 18

1. *Cocconeis placentula* var. *lineata* (Ehrenberg) Van Heurck (Laguna de Juanacatlán: modern sample).
2. *Cocconeis placentula* var. *lineata* (Ehrenberg) Van Heurck (Laguna de Juanacatlán: modern sample).
3. *Cocconeis placentula* var. *euglypta* (Ehrenberg) Grunow (Lago de Cajititlán: modern sample).
4. *Cocconeis pediculus* Ehrenberg (Laguna Quechulac: modern sample).
5. *Cocconeis pediculus* Ehrenberg (Laguna Quechulac: modern sample).
6. *Cocconeis diminuta* Pantocsek (Laguna Preciosa: modern sample).
7. *Cocconeis diminuta* Pantocsek (Laguna Alchichica: modern sample).
8. *Cocconeis diminuta* Pantocsek (Laguna Alchichica: modern sample).

# Plate 18

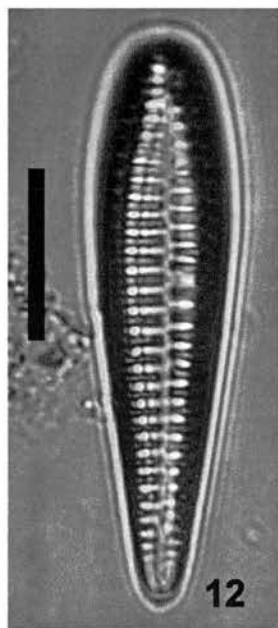
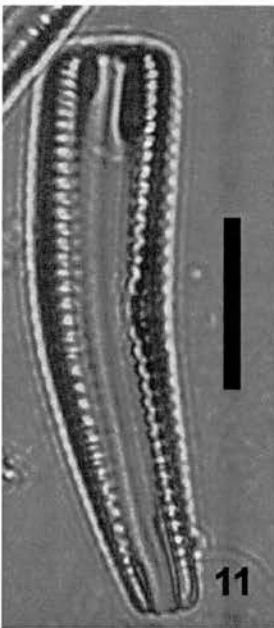
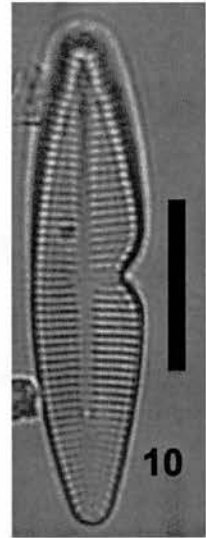
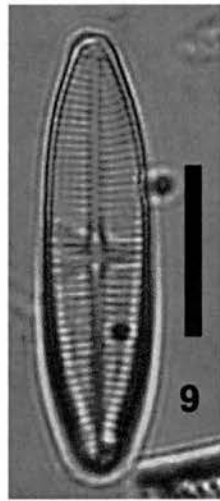
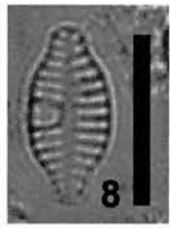
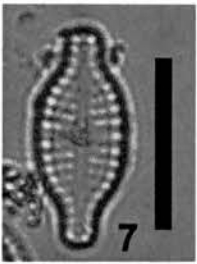
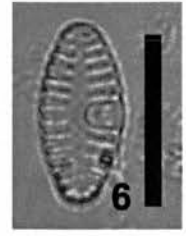
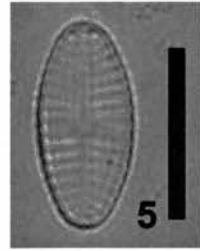
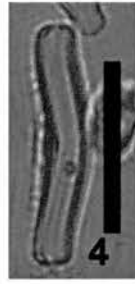
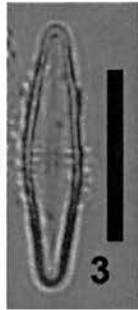
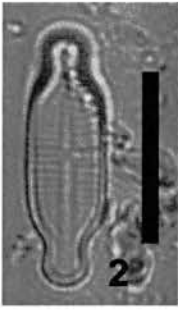
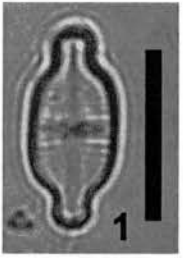


All figures: scale = 10 $\mu$ m

## Plate 19

1. *Achnanthes exigua* Grunow (La Yerbabuena: modern sample).
2. *Achnanthes exigua* Grunow (La Yerbabuena: modern sample).
3. *Achnanthes minutissima* Kützing (Laguna Preciosa: modern sample).
4. *Achnanthes minutissima* Kützing , girdle view (Laguna Quechulac: modern sample).
5. *Achnanthes lanceolata* (Brébisson) (Arroyo del Atajo: modern sample).
6. *Achnanthes lanceolata* (Brébisson) (Arroyo del Atajo: modern sample).
7. *Achnanthes lanceolata* var. *dubia* Grunow (Laguna de Juanacatlán: core material).
8. *Achnanthes lanceolata* var. *dubia* Grunow (Laguna de Juanacatlán: core material).
9. *Achnanthes hungarica* (Grunow) (Lago de Cajititlán: modern sample).
10. *Achnanthes hungarica* (Grunow) (Lago de Cajititlán: modern sample).
11. *Rhoicosphenia curvata* (Kützing) (Lago de Chapala: modern sample).
12. *Rhoicosphenia curvata* (Kützing) (Lago de Chapala: modern sample).

# Plate 19

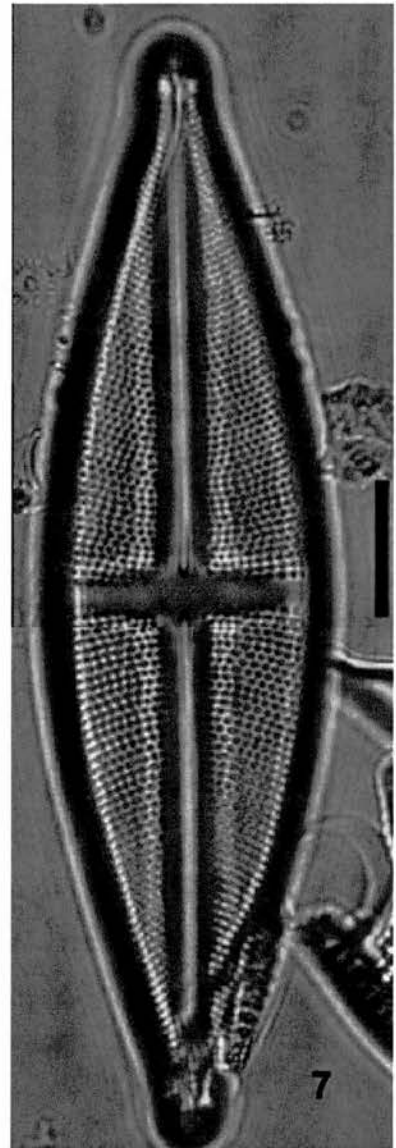
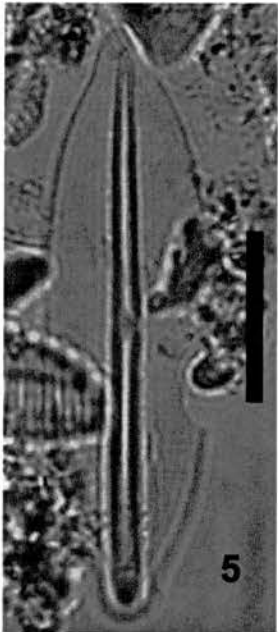
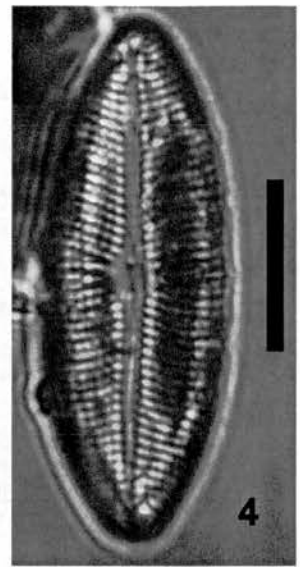
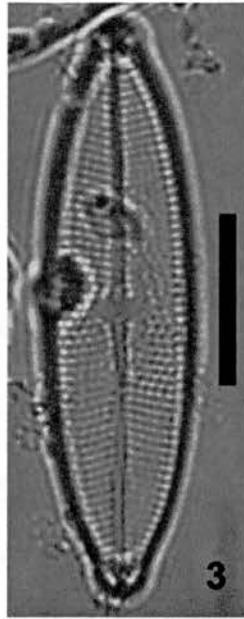
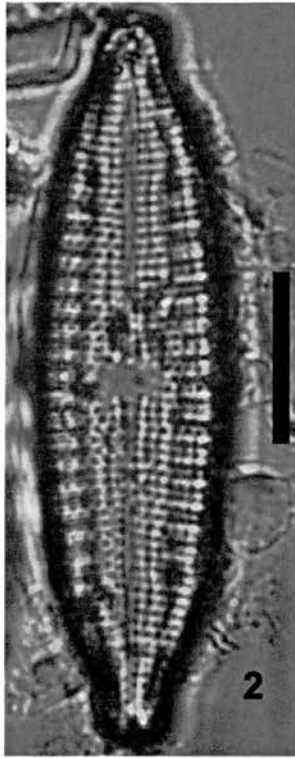
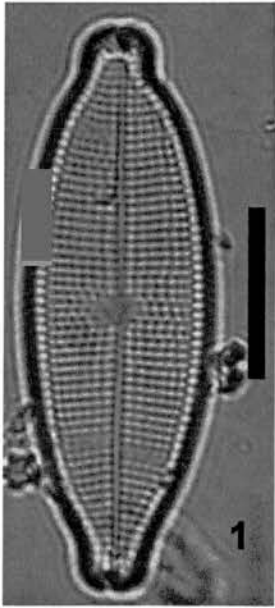


All Figures: scale = 10 $\mu$ m

## Plate 20

1. *Mastogloia smithii* Thwaites (Laguna Alchichica: modern sample).
2. *Mastogloia smithii* var. *lacustris* Grunow (Laguna Preciosa: modern sample).
3. *Mastogloia smithii* var. *lacustris* Grunow (Laguna Preciosa: modern sample).
4. *Mastogloia elliptica* C. Agardh. (Laguna Preciosa: modern sample).
5. *Frustulia rhomboides* var. *crassinervia* (Brébisson) Ross (Lagunilla de San Gregorio: modern sample).
6. *Amphipleura pellucida* (Kützing) Kützing (Lago de Zirahuén: core material).
7. *Stauroneis phoenicentron* (Nitzsch) Ehrenberg (Lago de Zirahuén, core material).

Plate 20

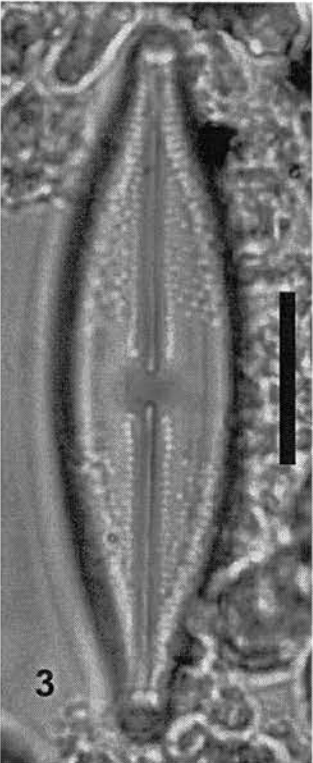
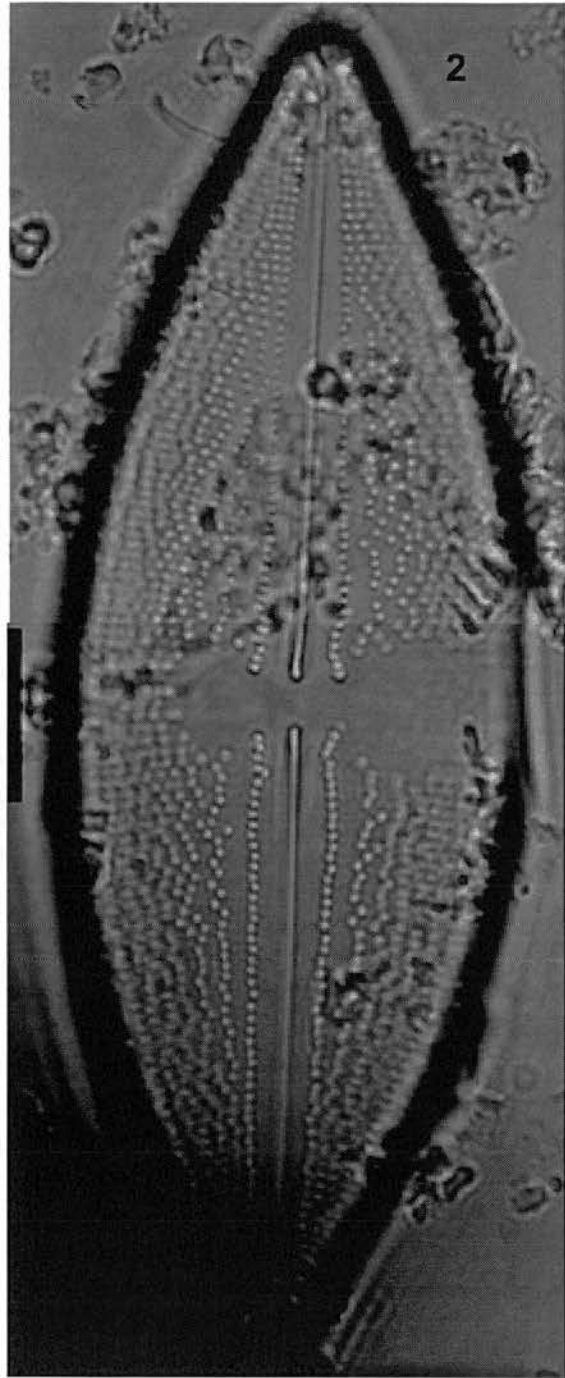
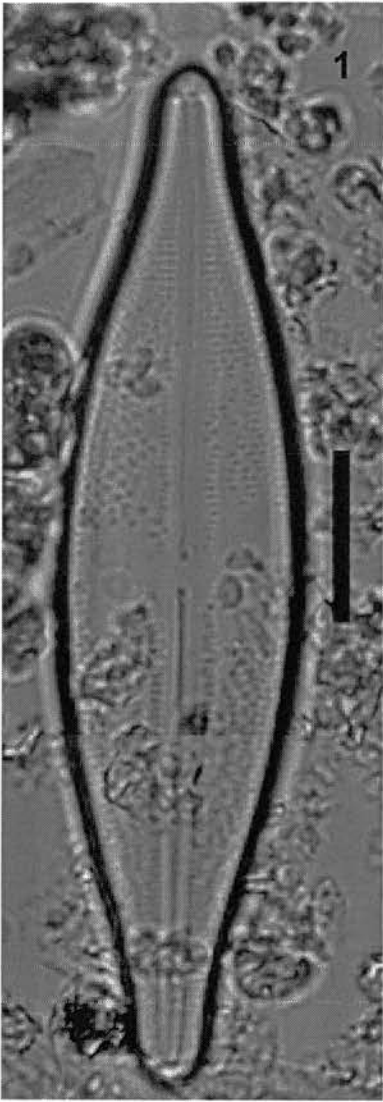


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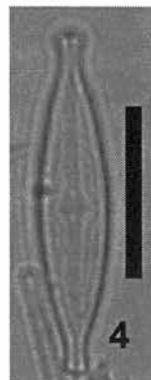
## Plate 21

1. *Anomoeoneis sphaerophora* (Ehrenberg) Pfitzer (La Piscina de Yuriria: modern sample).
2. *Anomoeoneis costata* (Kützing) Hustedt (La Piscina de Yuriria: modern sample).
3. *Anomoeoneis sphaerophora* var. *sculpta* (Ehrenberg) O. Müller (La Piscina de Yuriria: modern sample).
4. *Brachysira neoexilis* Lange-Bertalot (Lago de Zirahuén: modern sample).

# Plate 21



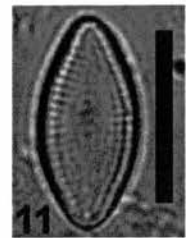
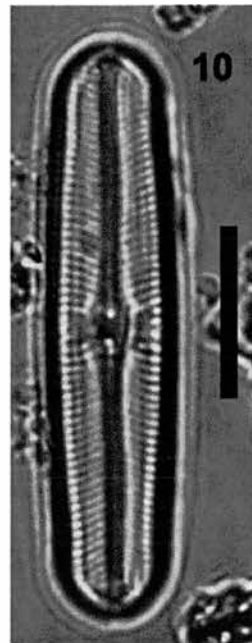
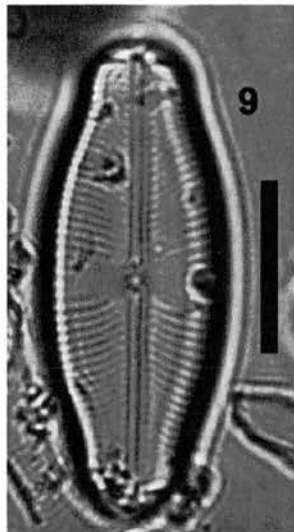
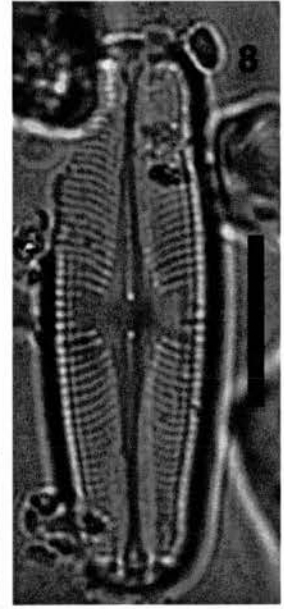
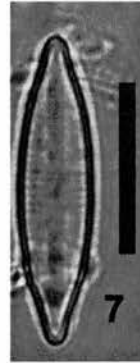
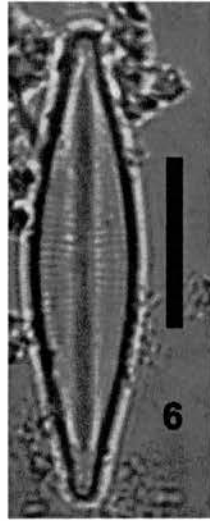
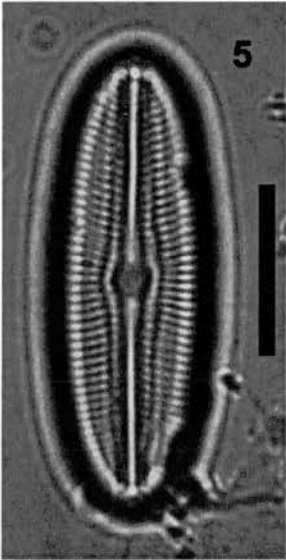
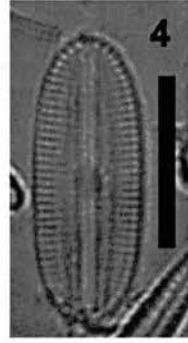
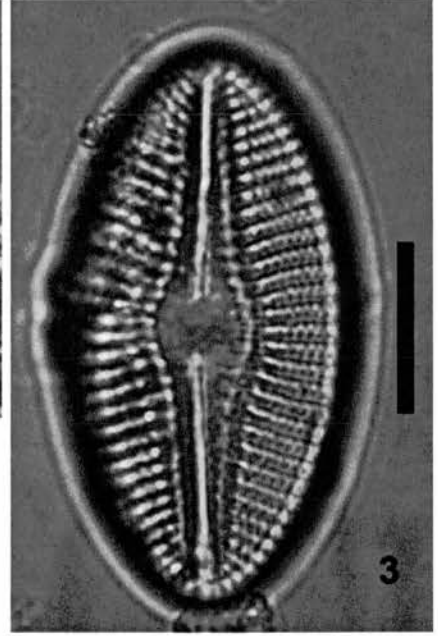
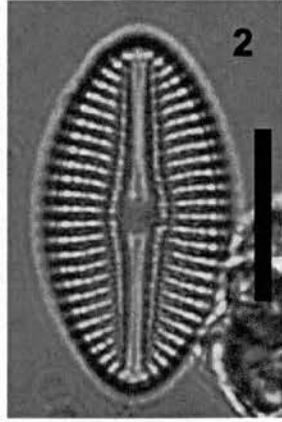
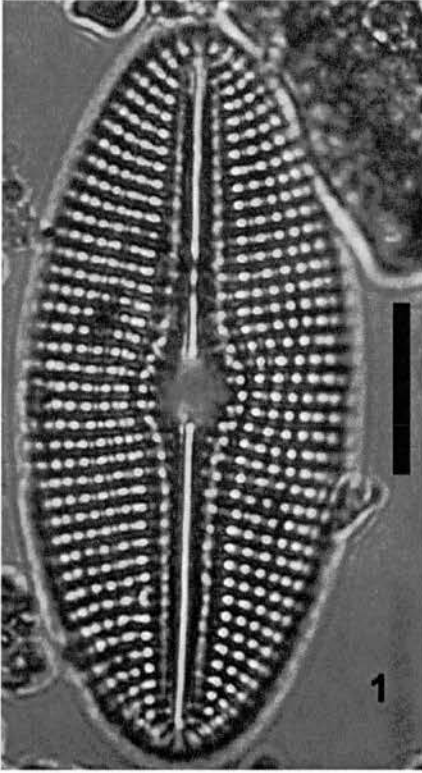
All Figures: scale = 10 $\mu$ m



## Plate 22

1. *Diploneis elliptica* (Kützing) Cleve (Lago de Zirahuén: core material).
2. *Diploneis elliptica* (Kützing) Cleve (Lago de Zirahuén: core material).
3. *Diploneis pseudovalis* Hustedt (Lago de Zirahuén: core material).
4. *Diploneis oculata* (Brébisson) Cleve (Lago de Zirahuén: core material).
5. *Diploneis oblongella* (Naegeli) Cleve-Euler (Laguna Alchichica: modern sample).
6. *Navicula halophila* (Grunow) Cleve (La Piscina de Yuriria: modern sample).
7. *Navicula elkab* Müller (La Piscina de Yuriria: modern sample).
8. *Navicula pupula* Kützing (Lago de Chapala: modern sample).
9. *Navicula pupula* Kützing (Lago de Zirahuén: core material).
10. *Navicula laevissima* Kützing (Lago de Zirahuén: core material).
11. *Navicula confervacea* Kützing (Laguna Potrerillo: modern sample).

Plate 22

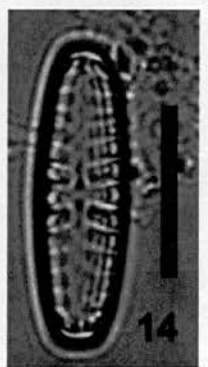
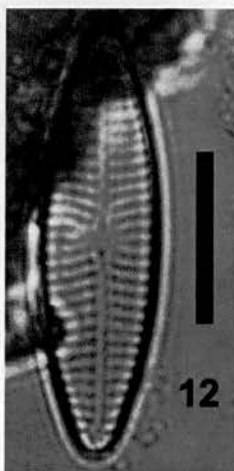
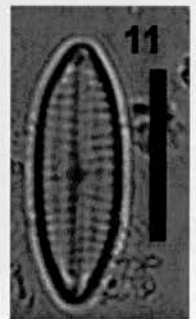
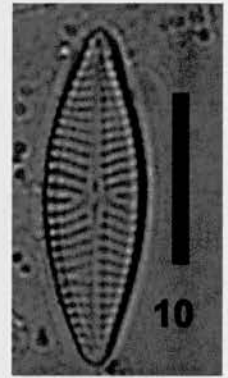
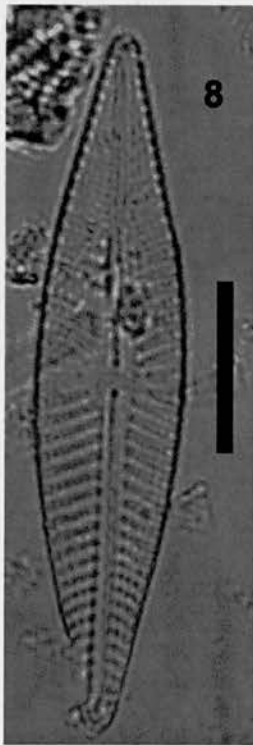
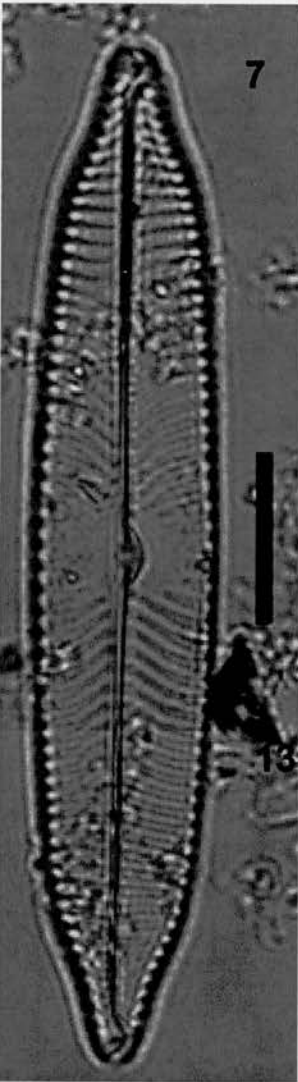
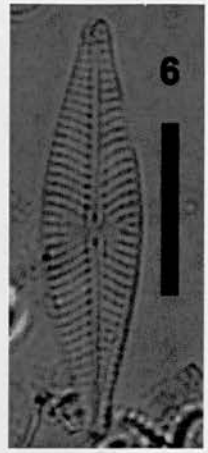
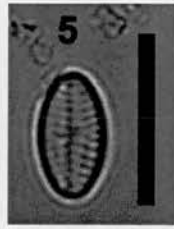
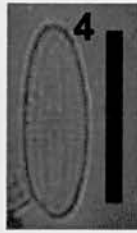
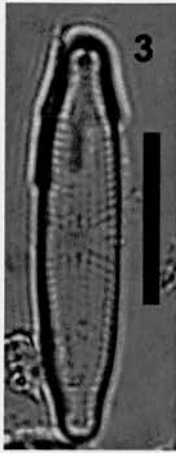
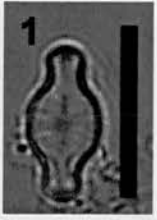


All Figures:  
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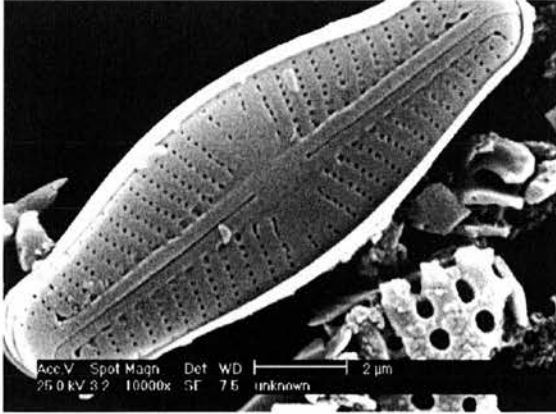
## Plate 23

1. *Navicula globosa* Meister (Lago de Zirahuén: core material).
2. *Navicula vitabunda* Hustedt (Lago de Zirahuén: core material).
3. *Navicula* cf. *absoluta* Hustedt (Lago de Zirahuén: core material).
4. *Navicula* cf. *seminulum* Grunow (Lago de Zirahuén: core material).
5. *Navicula subrotundata* Hustedt (Lago de Zirahuén: core material).
6. *Navicula cryptocephala* Kützing (Laguna de Juanacatlán: core material).
7. *Navicula viridula* var. *linearis* Hustedt (Lago de Zirahuén: core material).
8. *Navicula cymbula* Donkin (Lago de Zirahuén: core material).
9. *Navicula radiosa* Kützing (Lagunilla de San Gregorio: modern sample).
10. *Navicula radiosa* var. *tenella* (Brébisson) Van Heurck (Lago de Pátzcuaro: modern sample).
11. *Navicula graciloides* Mayer (Laguna Alchichica: modern sample).
12. *Navicula menisculus* Schumann (Laguna Preciosa: modern sample).
13. *Navicula capitata* Ehrenberg (Lago de Pátzcuaro: modern sample).
14. *Navicula capitata* var. *hungarica* (Grunow) Ross (Lago de Chapala: modern sample).

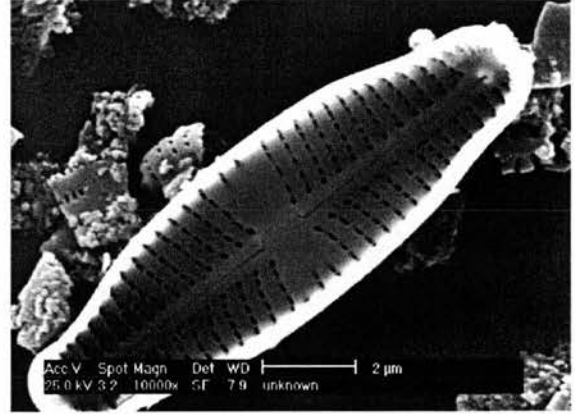
# Plate 23



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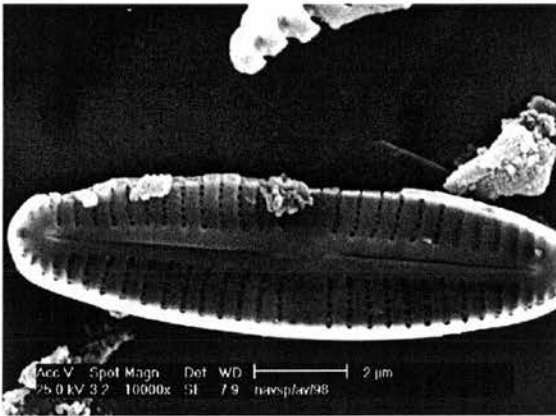


a

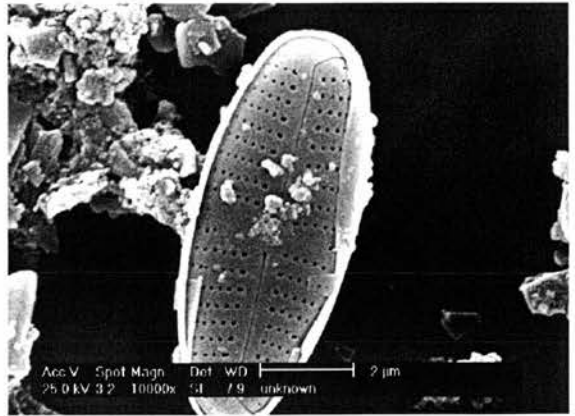


b

**Figure 1:** *Navicula* cf. *absoluta* (a) external view and (b) internal view (core material, Lago de Zirahuen).



a



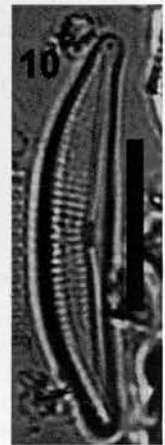
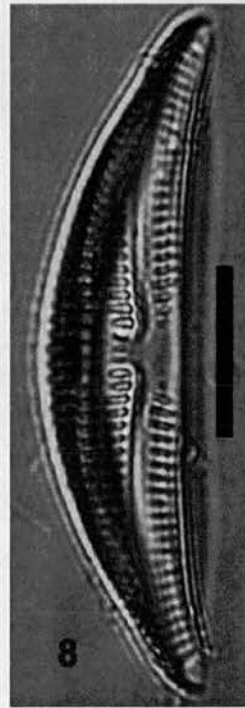
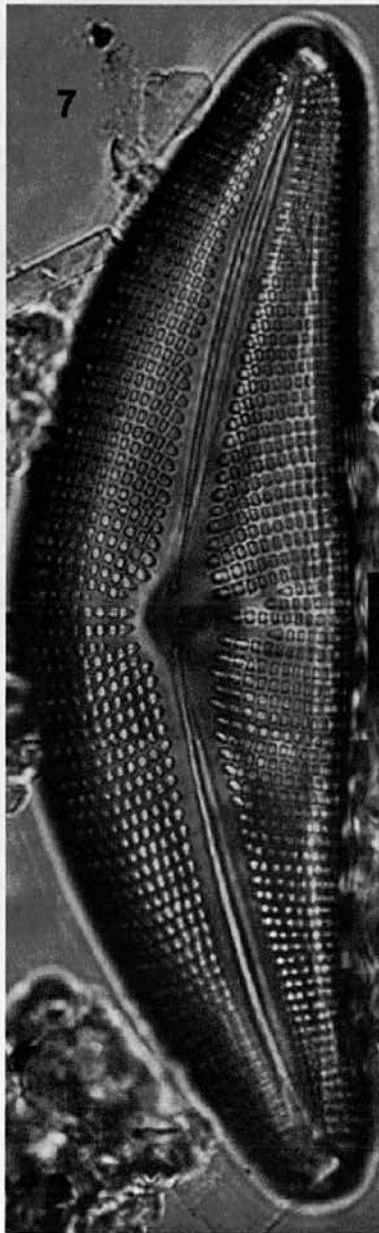
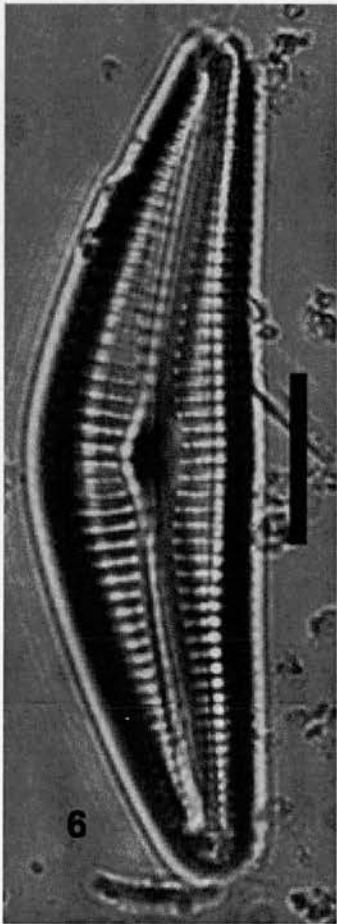
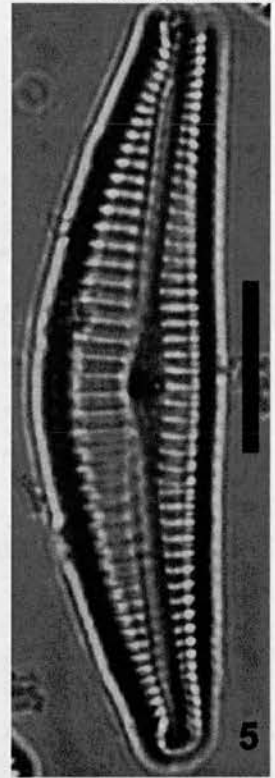
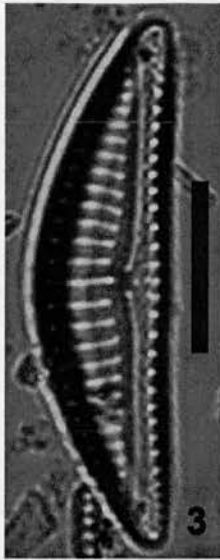
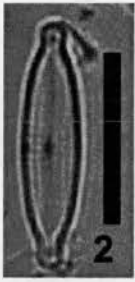
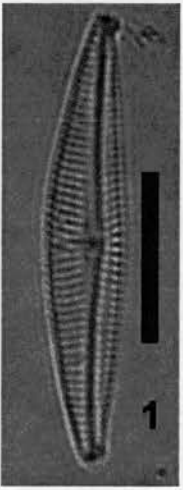
b

**Figure 1:** *Navicula* cf. *seminulum* (a) internal view and (b) external view (core material, Lago de Zirahuen).

## Plate 25

1. *Cymbella pusilla* Grunow (Laguna Alchichica: modern sample).
2. *Cymbella microcephala* Grunow (Lago de Zirahuén: modern sample).
3. *Cymbella minuta* var. *silesiaca* (Bleisch) Reimer (Lago de Zirahuén: core material).
4. *Cymbella sinuata* Gregory (Rio de la Palma: modern sample).
5. *Cymbella cymbiformis* C. Agardh (Lago de Zirahuén: core material).
6. *Cymbella cymbiformis* var. *nonpunctata* Fontell (Lago de Pátzcuaro: modern sample).
7. *Cymbella mexicana* (Ehrenberg) Cleve (Lago de Pátzcuaro: modern sample).
8. *Amphora ovalis* var. *affine* (Kützing) Van Heurck (Laguna Preciosa: modern sample).
9. *Amphora perpusilla* Grunow (Laguna Preciosa: modern sample).
10. *Amphora veneta* Kützing (Laguna Preciosa: modern sample).

**Plate 25**

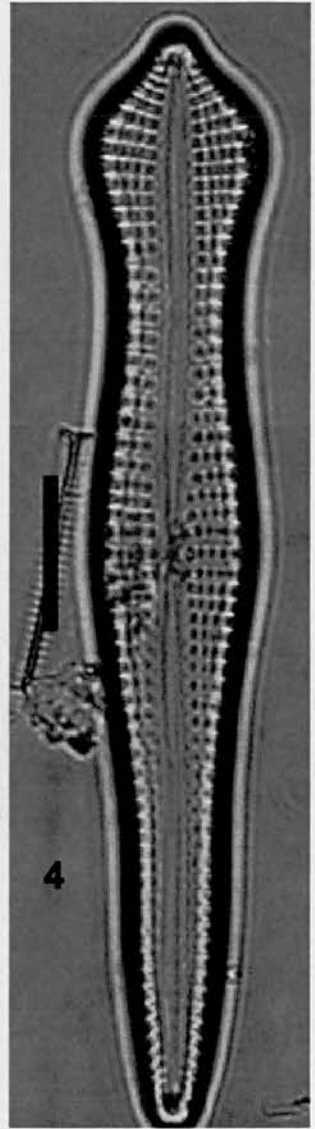
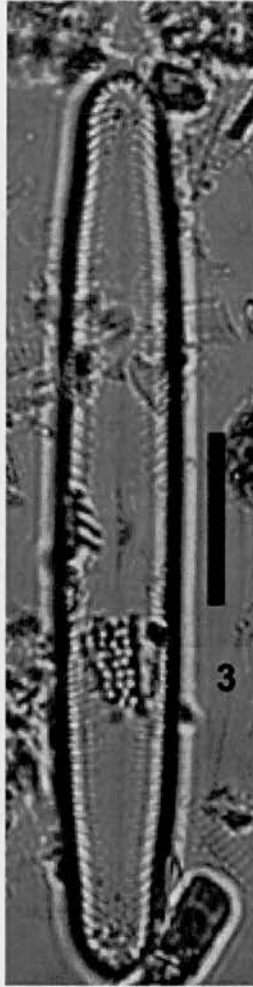
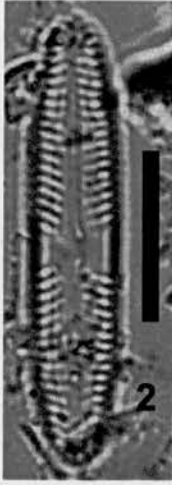
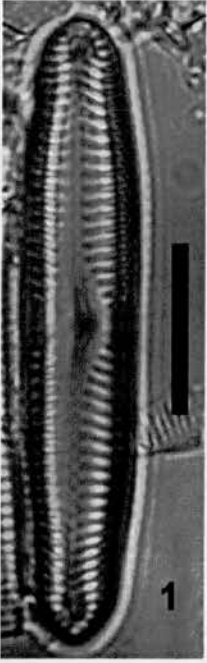


All Figures: scale = 10 $\mu$ m

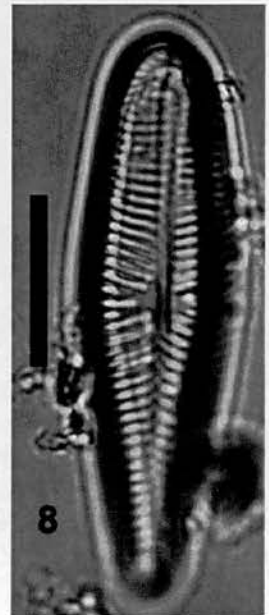
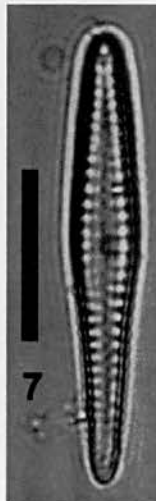
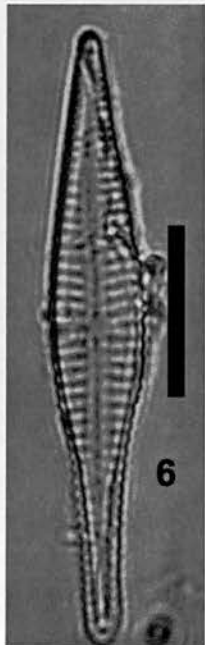
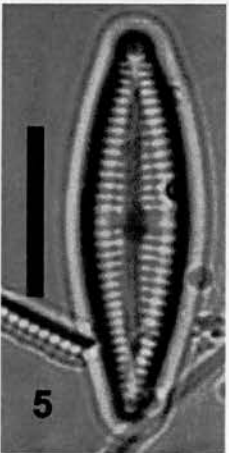
## Plate 26

1. *Pinnularia subcapitata* Gregory (Lagunilla de San Gregorio: modern sample).
2. *Pinnularia* cf. *microstauron* (Ehrenberg) Cleve (Lagunilla de San Gregorio: modern sample).
3. *Pinnularia abaujensis* var. *linearis* Patrick & Reimer (Lagunilla de San Gregorio: modern sample).
4. *Gomphonema acuminatum* Ehrenberg (Lago de Zirahuén: core material).
5. *Gomphonema parvulum* (Kützing) Kützing (Laguna Quechulac: modern sample).
6. *Gomphonema gracile* Ehrenberg (Lago de Zirahuén: core material).
7. *Gomphonema intricatum* var. *pusilla* Mayer (Lago de Zirahuén: core material).
8. *Gomphonema olivaceum* (Hornemann) Brébisson (Laguna Preciosa: modern sample).

# Plate 26



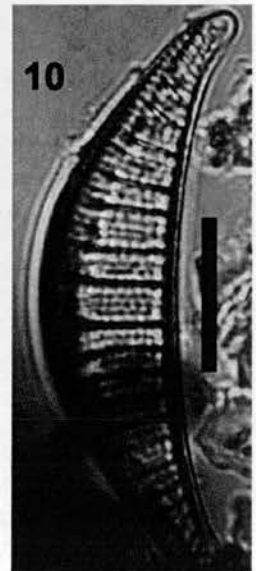
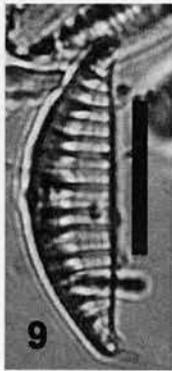
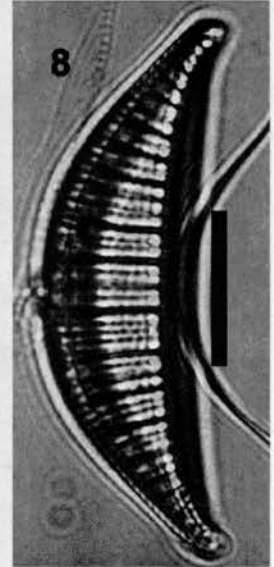
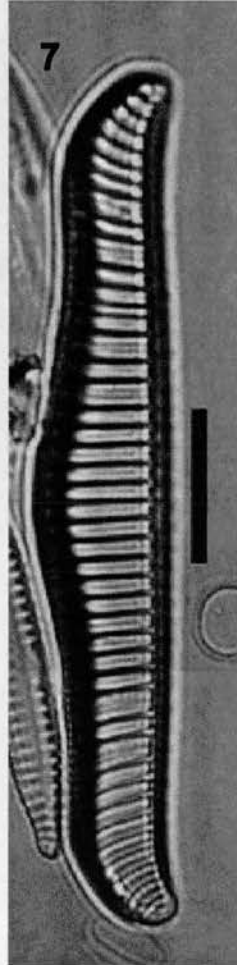
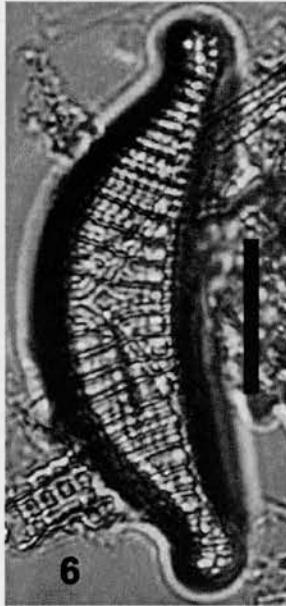
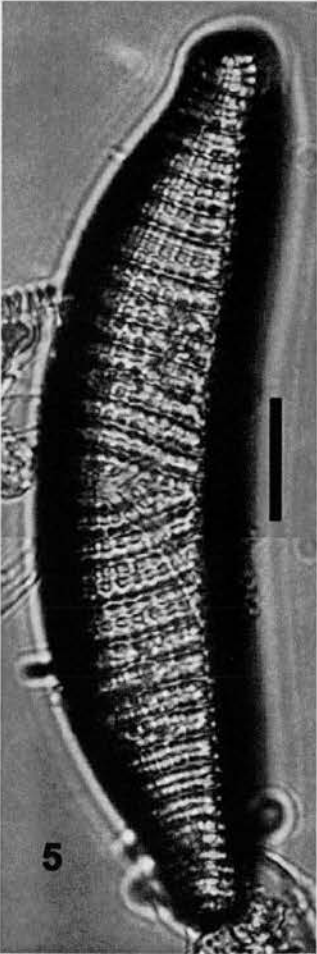
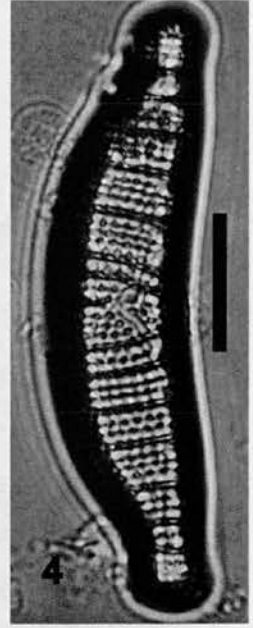
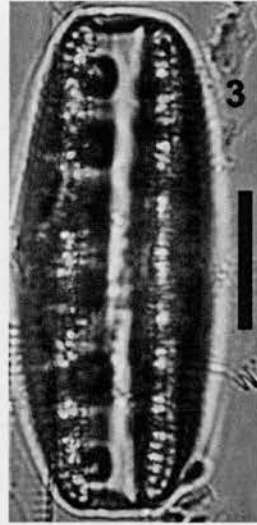
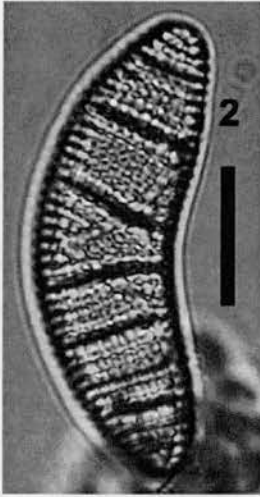
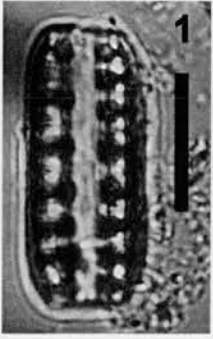
All Figures: scale = 10 $\mu$ m



## Plate 27

1. *Denticula elegans* Kützing (La Piscina de Yuriria: modern sample).
2. *Epithemia argus* (Ehrenberg) Kützing (Laguna Alchichica: modern sample).
3. *Epithemia argus* (Ehrenberg) Kützing (Laguna Preciosa: modern sample).
4. *Epithemia adnata* (Kützing) Brébisson (Lago de Zirahuén: core material).
5. *Epithemia turgida* (Ehrenberg) Kützing (Lago de Zirahuén: core material).
6. *Epithemia sorex* Kützing (Lago de Zirahuén: core material).
7. *Rhopalodia gibba* (Ehrenberg) Müller (Lago de Zirahuén: core material).
8. *Rhopalodia gibberula* var. *vanheurckii* Müller, coarse type (Laguna Alchichica: modern sample).
9. *Rhopalodia gibberula* var. *vanheurckii* Müller, fine type (Laguna Preciosa: modern sample).
10. *Rhopalodia musculus* (Kützing) O. Müller (Lago de Cuitzeo: modern sample).

# Plate 27

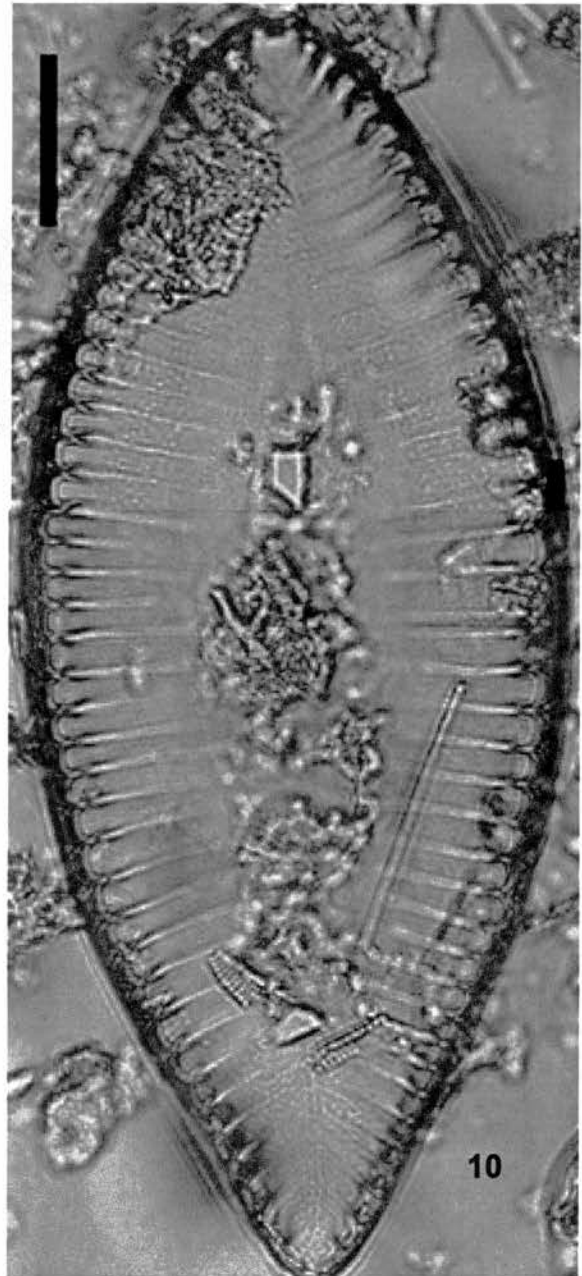
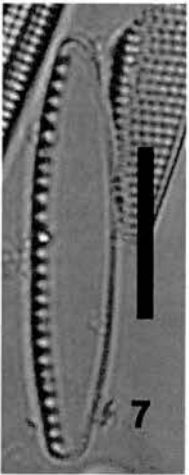
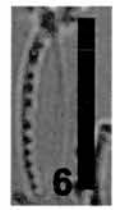
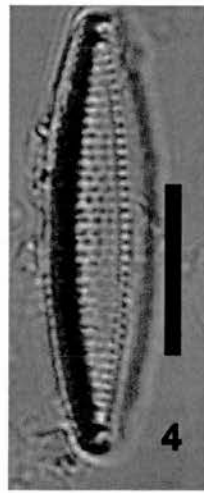
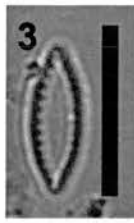
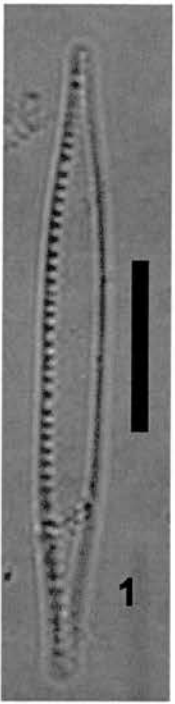


All Figures: scale = 10µm

## Plate 28

1. *Nitzschia palea* (Kützing) W. Smith (Lago de Pátzcuaro: modern sample).
2. *Nitzschia paleacea* Grunow (Lago de Pátzcuaro: modern sample).
3. *Nitzschia inconspicua* Grunow (Laguna Alchichica: modern sample).
4. *Nitzschia amphibia* Grunow (Lago de Zirahuén: core material).
5. *Nitzschia amphibia* f. *rostrata* Hustedt (Lago de Zirahuén: core material).
6. *Nitzschia romana* Grunow (Laguna Alchichica: modern sample).
7. *Nitzschia communis* Rabenhorst (Laguna Preciosa: modern sample).
8. *Nitzschia denticula* Grunow (Lago de Zirahuén: core material).
9. *Nitzschia valdestriata* Aleem & Hustedt (Lago de Zirahuén: modern sample).
10. *Surirella elegans* Ehrenberg (Lago de Zirahuén: core material).

# Plate 28



Figures 1-9: scale = 10 $\mu$ m  
Figure 10: scale = 25 $\mu$ m

## Plate 29

1. Sponge spicule (Lago de Pátzcuaro: modern sample).
2. Chrysophyte statocyst with smooth surface(Laguna de Juanacatlán: core material).
3. Chrysophyte statocyst with spines (Laguna de Juanacatlán: core material).
4. *Mallomonas pseudocoronata* (Laguna de Juanacatlan: core material).
5. SEM image of *Mallomonas pseudocoronata* (Laguna de Juanacatlán: core material).
6. SEM image of *Mallomonas pseudocoronata* (Laguna de Juanacatlán: core material).

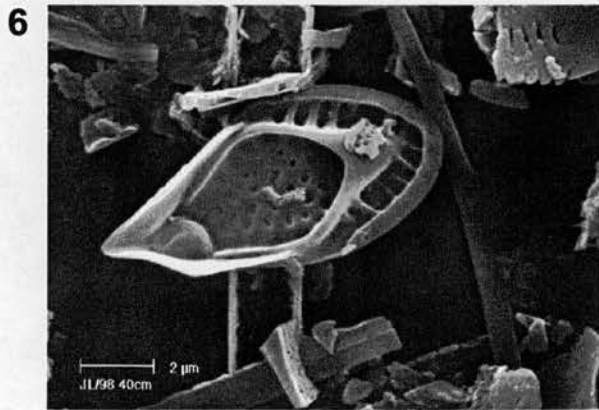
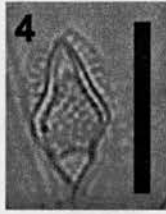
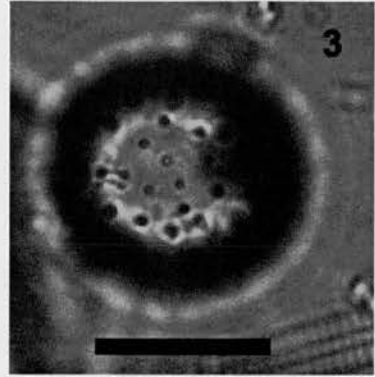
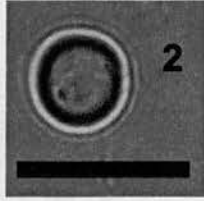
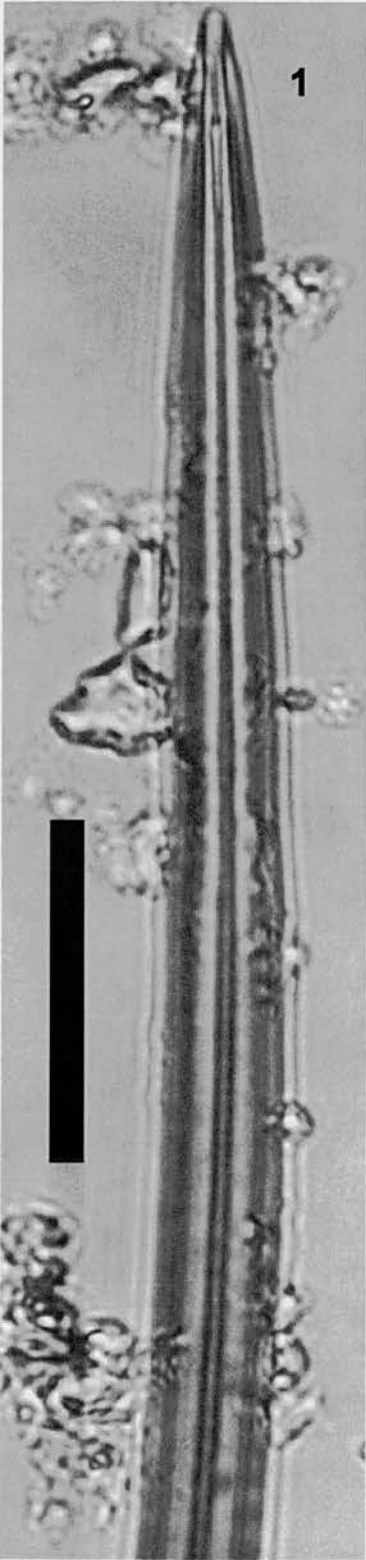


Figure 1: scale = 25 $\mu$ m  
Figures 2-4: scale = 10 $\mu$ m